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ABSTRACT

This report presents an analysis of the issues influencing the preparation of physicians in the United States and recommends changes in teaching programs. Findings and associated recommendations are organized into eight areas: (1) understanding the system in which health care is delivered; (2) establishing practical and relevant teaching sites; (3) developing community clinician teachers; (4) revising the curriculum content and learning process; (5) reinforcing communication skills; (6) assuring quality and accountability in physician education; (7) financing the evolution of graduate medical education; and (8) sustaining quality and vitality in medical education. Following an executive summary, the report provides background information on the changing practice of medicine, the evolving curricula in medical education, and changing the environment of clinical education. Most of the report consists of detailed analyses of the findings and recommendations in each of the eight areas. (Contains approximately 160 print references and 10 Internet resources.) (DB)

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COUNCIL ON GRADUATE MEDICAL EDUCATION

Thirteenth Report

Physician Education for a Changing Health Care Environment

MARCH 1999

HE 032 204

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COUNCIL ON GRADUATE MEDICAL EDUCATION

Thirteenth Report

Physician Education for a Changing Health Care Environment

March 1999

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Health Resources and Services Administration

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The Council on Graduate Medical Education

The Council on Graduate Medical Education (COGME) was authorized by Congress in 1986 to provide an ongoing assessment of physician workforce trends, training issues and financing policies, and to recommend appropriate Federal and private sector efforts to address identified needs. The legislation calls for COGME to advise and make recommendations to the Secretary of the Department of Health and Human Services (DHHS), the Senate Committee on Labor and Human Resources, and the House of Representatives Committee on Commerce. The Health Professions Education Partnerships Act of 1998 reauthorized the Council through September 30, 2002.

The legislation specifies 17 members for the Council. Appointed individuals are to include representatives of practicing primary care physicians, national and specialty physician organizations, international medical graduates, medical student and house staff associations, schools of medicine and osteopathy, public and private teaching hospitals, health insurers, business, and labor. Federal representation includes the Assistant Secretary for Health, DHHS; the Administrator of the Health Care Financing Administration, DHHS; and the Chief Medical Director of the Veterans Administration.

Charge to the Council

The charge to COGME is broader than the name would imply. Title VII of the Public Health Service Act, as amended, requires COGME to provide advice and recommendations to the Secretary and Congress on the following issues:

1. The supply and distribution of physicians in the United States.
2. Current and future shortages or excesses of physicians in medical and surgical specialties and subspecialties.
3. Issues relating to international medical school graduates.
4. Appropriate Federal policies with respect to the matters specified in items 1-3, including policies concerning changes in the financing of undergraduate and graduate medical education (GME) programs and changes in the types of medical education training in GME programs.
5. Appropriate efforts to be carried out by hospitals, schools of medicine, schools of osteopathy, and accrediting bodies with respect to the matters specified in items 1-3, including efforts for changes in undergraduate and GME programs.
6. Deficiencies and needs for improvements in data bases concerning the supply and distribution of, and postgraduate training programs for, physicians in the United States and steps that should be taken to eliminate those deficiencies.

In addition, the Council is to encourage entities providing graduate medical education to conduct activities to voluntarily achieve the recommendations of the Council specified in item 5.

COGME Reports

Since its establishment, COGME has submitted the following reports to the DHHS Secretary and Congress:

- First Report of the Council (1988)
- Second Report: The Financial Status of Teaching Hospitals and the Underrepresentation of Minorities in Medicine (1990)
- Scholar in Residence Report: Reform in Medical Education and Medical Education in the Ambulatory Setting (1991)
- Third Report: Improving Access to Health Care Through Physician Workforce Reform: Directions for the 21st Century (1992)
- Fourth Report: Recommendations to Improve Access to Health Care Through Physician Workforce Reform (1994)
- Fifth Report: Women and Medicine (1995)
- Sixth Report: Managed Health Care: Implications for the Physician Workforce and Medical Education (1995)
- Seventh Report: Physician Workforce Funding Recommendations for Department of Health and Human Services' Programs (1995)
- Report to Congress: Process by Which International Graduates Are Licensed to Practice in the United States (1995)
- Eighth Report: Patient Care Physician Supply and Requirements: Testing COGME Recommendations (1996)

- Ninth Report: Graduate Medical Education Consortia: Changing the Governance of Graduate Medical Education to Achieve Physician Workforce Objectives (1997)
- Tenth Report: Physician Distribution and Health Care Challenges in Rural and Inner-City Areas (1998)
- Eleventh Report: International Medical Graduates, The Physician Workforce and GME Payment Reform (1998)
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Executive Summary

PURPOSE

This report is intended to clarify the need for, and to stimulate the further development of, fresh approaches to the professional education of physicians for contemporary and future medical practice. It presents an analysis of the issues influencing the preparation of physicians and recommends changes in teaching programs. Unlike previous COGME reports which have focused on primary care, the recommendations in this report apply to preparation for many medical specialties. In particular, the importance of clinical education in the community is no longer limited to the primary care specialties. In many specialties, the community offers unique educational opportunities that are complementary to those of the academic health center or teaching hospital. The comprehensive preparation of all modern physicians requires experience in both traditional and community settings.

This report advocates the development of high-quality, community-based clinical teaching opportunities and a faculty incorporating community clinician teachers. It calls for expansion and enhancement of educational relationships with the community and a redefinition of the role of conventional medical school and residency program faculty. In addition, the report emphasizes the role of rigorous evaluation systems to assure consistent quality and guide the steady evolution of educational systems. Finally, the report addresses strategies to fund and sustain the recommended changes.

The findings and associated recommendations forming the core of the report are listed below:

I. UNDERSTANDING THE SYSTEM IN WHICH HEALTH CARE IS DELIVERED

FINDING 1 (page 8): Physicians increasingly deliver health care to defined populations of patients in the context of integrated delivery systems or health plans. An improved understanding of the characteristics of the populations served and the attributes of the delivery systems is fundamental to effective medical practice.

Recommendations:

- **Medical students and residents should learn the basic principles of health care financing, the benefits and limitations of typical health plans, and the characteristics of the systems in which health care may be delivered.**
- **The curricula of medical schools and residency training programs should include clinical learning experiences in the settings of each of the components of an integrated health care delivery system**
- **Medical schools and residency training programs should provide opportunities for medical students and residents to learn the contribution of other health professionals to the care of their patients and augment opportunities for learners to participate in a team approach to patient care.**
- **Educational programs for medical students and residents should address the care of the individual patient in the context of the population or community of which the patient is a member.**

II. ESTABLISHING PRACTICAL AND RELEVANT TEACHING SITES

FINDING 2 (page 9): There will be an acceleration in the development of new models of medical education that reflect more closely the practice of medicine within evolving health systems.

Recommendations:

- **Clinical education should occur in settings that are representative of the environment in which graduates will eventually practice. Medical schools and residency training programs should develop or acquire clinical teaching sites that offer the best learning opportunities and the highest standards of clinical practice. Partnerships with integrated delivery systems, health plans and other organizations should be developed as one strategy to accomplish this.**
- **Medical educators should exploit the potential of distance learning technology to deliver educational programs in which**

instruction and evaluation are of a consistent and high standard across multiple settings in the community.

III. DEVELOPING COMMUNITY CLINICIAN TEACHERS

FINDING 3 (page 13): The selection and support of clinician teachers in the community will become a fundamental priority of medical schools and residency training programs. The current roles of faculty members based at conventional teaching institutions will be significantly changed by expanded concepts of medical education and more inclusive definitions of faculty membership.

Recommendations:

- Medical schools and residency training programs should recruit and support community clinician teachers. Faculty members at community teaching sites should be selected for the quality of their medical practice and the excellence of their teaching. They should be paid and otherwise rewarded for their educational activities. Teaching institutions should develop mechanisms to involve community faculty in the design and operation of educational programs.
- Medical school and residency faculty should complement their skills as teachers of students and residents with competencies in faculty development and the management of educational programs in the community.
- Residency training programs should take the lead in the development of rigorous practice-based models of graduate medical education in which individual or limited numbers of residents are assigned to physicians in community teaching practices.

IV. REVISING THE CURRICULUM CONTENT AND LEARNING PROCESS

FINDING 4 (page 15): The transformation of the health care environment created by changing demographics, mechanisms of health care financing, and a focus on prevention and wellness, has a profound effect on the practice of medicine. Reflecting these changes in educational programs that prepare medical students and residents for their future roles requires innovative strategies and new resources.

Recommendations:

- Medical schools and residency training programs should fundamentally revise the preparation of their graduates to reflect the changing practice environment while sustaining the quality of current teaching programs. They should emphasize disciplines that are basic to contemporary medical practice such as epidemiology and population-based care, health care policy and systems, disease prevention and wellness, and computer information skills.
- To effectively serve patients in the new health care systems, educational programs must prepare physicians in ethical decision-making and advanced communication skills, including patient advocacy, conflict resolution, and teamwork.
- Medical schools and residency training programs should accelerate the incorporation of advanced educational concepts and techniques such as distance learning, standardized patients, and psychometrics in order to enhance the quality and consistency of educational programs.

V. REINFORCING COMMUNICATION SKILLS

FINDING 5 (page 18): An increasingly diverse patient population and a changing health care environment magnify the need for effective communication by physicians.

Recommendations:

- Instruction in and assessment of communication skills, particularly related to the medical history, should be strengthened and expanded to ensure an emphasis equal to other major courses and topics.
- The development and augmentation of communication skills with patients including those from differing cultural backgrounds, and with colleagues, administrators, and others should be continued throughout medical school and residency training.

- Physicians should be prepared in a broad range of communications skills appropriate for use with individuals and groups and utilizing a diversity of media. An emphasis should be provided on continually updating skills to adapt to rapidly-evolving circumstances and technology

VI. ASSURING QUALITY AND ACCOUNTABILITY IN PHYSICIAN EDUCATION

FINDING 6 (page 20): The assurance of consistent quality in medical education will become increasingly critical as clinical teaching outside the traditional hospital setting expands and as teaching strategies become more diverse. Methods designed to assess performance evaluation at multiple sites and assure the longitudinal development of knowledge, skills, and attitudes are becoming increasingly important.

Recommendations:

- Medical educators should continuously assess both short-term and longitudinal outcomes in the learner, the teacher, and the program.
- Assessment techniques must be selected to provide reliable and valid measurement of educational outcomes across a variety of teaching environments.
- Academic health centers, educational programs, and accrediting agencies should continue to develop monitoring and assessment approaches that meet the needs of different constituencies.

VII. FINANCING THE EVOLUTION OF GRADUATE MEDICAL EDUCATION

FINDING 7 (page 24): The system of funding graduate medical education through teaching hospitals has inherent limitations and disincentives that inhibit the development of ambulatory experiences and community-based educational programs. There is still no consensus on how to appropriately fund and expand the curriculum to reach into community settings.

Recommendations:

- A stable reliable source of funding for graduate medical education is essential. While it is appropriate to assume that the Federal government through the Medicare program will continue to support graduate medical education, COGME endorses efforts to ensure that all payors, including the Federal government, support an equitable share of medical education costs.
- Medical schools, teaching hospitals and major stakeholders should prepare to finance physician education programs that incorporate the changes recommended in this report. Most of the funds to support these changes will require shifting existing internal resources within the academic enterprise.
- Funding for residency programs must provide the flexibility to meet the educational needs of residents. Program funding should be structured to enable residents to attain the knowledge, skills, attitudes and values that will meet both the profession's goals and community needs.
- The value of graduate medical education to the sponsoring institution should be determined through a candid and explicit assessment of its financial, educational, and service contribution to the achievement of the institution's mission.

VIII. SUSTAINING QUALITY AND VITALITY IN MEDICAL EDUCATION

FINDING 8 (page 26): Creating and sustaining the educational changes required to respond to the changing medical environment will continue to be a challenge given the pressures of the medical marketplace and the complex missions of medical schools, academic medical centers and other teaching hospitals.

Recommendations:

- Medical schools, residency training programs, and teaching hospitals must balance their competing roles and reaffirm their educational mission. They should embrace the task of meeting societal need through the education of their graduates.

- **The standards for accreditation and financial support of residency programs should be revised to encourage and facilitate new curriculum content, and opportunities to acquire additional knowledge, skills, attitudes and values.**

Background

THE CHANGING PRACTICE OF MEDICINE

The practice of medicine has been transformed in the last decade and the pace of change shows no signs of lessening. This transformation reflects adaptation both to the burgeoning scientific and technical abilities of medicine and to dramatic developments in demographic, social, political, and cultural aspects of health. Rapid progress in research and technology continues to expand the power of medical treatment, redefine fundamental understandings and practices, and raise expectations of the medical system. Simultaneously, a more diverse and sophisticated society is questioning what constitutes "health" and how we value its acquisition and maintenance. These complex interactions have many important dimensions, but organizational and financial influences have proved particularly pervasive. The public now expects dependable professional expertise from physicians and other members of the health care team in systems that are comfortable, affordable, and accessible.

Within the physician encounter itself, the combination of "high tech and high touch" is increasingly valued. Physicians are expected to appreciate the patient perspective, communicate effectively, ***and*** to maintain an uncompromising mastery of appropriate scientific and clinical advances. Physicians are held accountable for their services to an extent not previously imagined. This accountability goes beyond the outcomes of technical aspects of care to include service-oriented dimensions such as communication and patient satisfaction. Accountability for costs and the necessity to demonstrate value in patient care activities are now almost universal.

Financial factors play a significant and complex role in the changing practice of medicine. Profound changes have occurred in the methods used to finance health care. Pre-payment and managed care models have become firmly established and in many areas have replaced fee-for-service as the dominant financial models. In 1996, over 77 million Americans were enrolled in one form of managed care, Health Maintenance Organizations (HMOs), and the "HMO penetration" was reported to range from nearly 60% in Delaware to under two percent in Mississippi with a U.S. average of 29% (Managed Care Digest Series, 1997). Enrollment in HMOs rose by 14.4% between 1995 and 1996 and growth of various forms of managed care is projected to continue (Rivo, Mays, Katzoff, Kindig, 1995). As recently stated by this Council, more than two thirds of the population could be participants in managed care by the end of the century and it is possible that current medical students may never experience a fee-for-service practice (COGME Resource Paper, 1997).

Most pre-payment models are based on the concepts of "managed care". This term applies to a heterogeneous and rapidly-evolving group of organizations providing diverse health care programs, which share the common attribute of linking the financing and delivery of health care (Iglehart, 1992). A common feature is that selected health professionals and organizations furnish an established set of services to a defined population for a predetermined cost, in a system with significant utilization and quality control mechanisms. Managed care organizations encompass a spectrum from highly-capitated staff model systems that own facilities and employ physicians, to organizations that contract with independent physicians, hospitals, and other agencies for specific services.

Recent trends have modified the original models of managed care and have favored plans that offer greater flexibility. The number of staff-model HMOs has shown a steady decline from 66 in 1989 to 46 in 1996, whereas the number of network-model HMOs and Independent Practice Associations (IPAs) has continued to rise. Approximately two-thirds of current HMOs are IPAs (Managed Care Digest Series, 1997). The parameters set by the core features (specified services and providers, defined population, predetermined costs, and utilization and quality control mechanisms) are likely to endure even in the rapidly-changing health care market. Further evolution of managed care models will depend not only on the desires of patients and health care professionals, but also on the interests of employers, legislators, and investors. Arrangements in which physicians' incomes are linked to their ability to provide cost-effective care will probably persist, but patient satisfaction and other non-traditional measures of the quality of physician services are likely to become integral to the calculation of physician rewards. Similarly, future competition between plans may not be based exclusively on costs but include concepts from the "service sector" such as quality, value, service, and patient satisfaction. (O'Connor, Solberg, Baird, 1998). The

emphasis on primary care and ambulatory services with a concomitant reduction in the rate and duration of hospital admissions is unlikely to disappear even in a rapidly-changing and unpredictable environment. Conversely, the emphasis on health screening, preventive services, and wellness of individuals and communities (COGME Resource Paper, 1997) may be challenged as patient switching between plans negates the long-term financial incentive to avoid future illness.

Although the eventual outcomes of market and other forces are hard to predict, cost containment will clearly continue to be a feature of health care delivery systems. It also appears certain that most physicians in the future will interact with some form of managed care. The relationships between physicians and managed care organizations or similar organizations are likely to cover a spectrum from physicians in the role of employees to contractual or more distant relationships.

EVOLVING CURRICULA IN MEDICAL EDUCATION

Changes in medical practice have profound implications for physician education. In 1995, the Pew Commission called on educational institutions to lead rather than react to changes in the health care system:

> ***"There exists an overwhelming need for new emphases in health professions education to address the emerging and evolving health care system . . . educational institutions must lead the change process, and indeed in so doing both help developing practitioners form the values that define their profession and reinterpret those values as the configurations and demands of the health care system change."***

Innovative and creative programs are required to ensure that the preparation of physicians for the realities of future practice is based upon knowledge, skills, attitudes, and behaviors that reflect the highest professional standards and traditions.

Medical education reform has been proposed and documented in several reports published during the past two decades. Each report has advocated specific changes and acknowledged the complexities and difficulties of continuously updating medical education, particularly the long time scale of seven-ten years to acquire professional qualifications. The importance of volunteer faculty was only one element stressed in the comprehensive "Future Directions for Medical Education" report by the American Medical Association (AMA) in 1982. The 1984 report of the Association of American Medical Colleges (AAMC) on the "General Professional Education of the Physician: Physicians for the 21st Century" (GPEP) also addressed the need for revision of the content and process of medical education, and drew particular attention to the relationship between the numbers, specialties, and skills of physicians trained and the projected needs of the population. The challenge of preparing physicians for lifelong practice during times of exponential scientific advances was one of several themes in two reports sponsored by the Macy Foundation (1983 and 1988). In spite of considerable study and activity, the comprehensive review, "Assessing Change in Medical Education: the Road to Implementation" (ACME-TRI) concluded that by 1990, medical schools had responded unevenly to the call for educational change and the overall pace of change had been slow. The ACME-TRI report identified major barriers to change and suggested strategies by which both medical schools and related organizations could improve medical education.

Recent years have seen considerable changes in the content of curricula for medical students and residents and substantial innovations in the methods used in medical education. Two recurrent themes of particular relevance to this report have been the importance of "align(ing) the content of medical education programs with evolving societal needs, practice patterns, and scientific developments" (MSOP:Report II, 1998); and an increasing appreciation of the role of measurable learning objectives to guide the design, content, and conduct of educational programs (Kassebaum, Eaglen Cutler,1997). The ambitious Medical Schools Objectives Project (MSOP) of the Association of American Medical Colleges (AAMC) aims to develop a national consensus on the attributes of medical graduates and to articulate these attributes as learning objectives applicable to curricula in individual medical schools (MSOP Report I, 1998). In the more diverse area of graduate medical education, accreditation and review processes have increasingly stressed attainment of measurable learning objectives and documentation of competencies.

Both ACME-TRI (1992) and the Pew Health Professions Commission (1995) emphasized that addressing the problems in medical education required profound institutional change. The Pew Commission stated:

> ***"Changing health professions education to meet today's challenges, however, will require health professions educators to do more than add courses on health care delivery, organization, and finance, and establish clinical training experiences in managed care settings. It will also require them to articulate***

and demonstrate institutional missions and values that are in concert both with the nation's health care needs and health care systems directions; fundamentally reform core curriculum; develop new political and economic partnerships; focus on the needs of communities; and strengthen the tools needed to effect some institutional change."

To fulfill their mandate to prepare physicians for practice, medical education institutions, therefore, must implement extensive changes which go beyond the expected continual updating of curricular content to reflect the exponential expansion of knowledge in the disciplines and sciences pertinent to medical practice. This alone is a daunting task. It is now recognized that fundamental changes in the organization of medical education are required to adequately prepare physicians for modern practice. For many reasons, most U.S. medical schools and residency programs have revised mission statements, undergone strategic planning exercises, and or undertaken organizational re-structuring during the last decade - and expect to continue such processes. The reaffirmation of education as the "core business and unique function" (Cohen, 1997) of training programs and the development of strategies to ensure its success are essential amid the turmoil and competing demands of the healthcare environment.

Finally, in addition to the curricular and organizational dimensions noted above, medical student and resident programs are undergoing an "educational revolution". Nationwide, traditional curricula and teaching methods are being replaced by programs based on adult learning principles. These are characterized by more intense small group learning and stringent evaluation based on a demonstration of competencies. Teaching faculty find themselves in a process of "re-engineering" complex systems of curriculum design, delivery, and evaluation while at the same time meeting the expectation to lead, or keep abreast of, the scientific developments in their individual disciplines. The revision of educational programs is an exciting challenge, but it is also demanding and exhausting to faculty members who are struggling to maintain research programs and preserve clinical income.

CHANGING THE ENVIRONMENT OF CLINICAL EDUCATION

The educational reforms outlined above expand the combination and synergy of didactic and experiential learning in medical education. The system, especially at the residency level, requires extensive participation in patient care. The changing practice of medicine profoundly affects the patient-based resources for the education of future physicians and determines the optimal environment in which education should take place. For many functional, organizational, and cultural reasons, managed care systems and traditional academic training sites have been described as "structurally incompatible" (Fox, Wasserman, 1993).

Teaching institutions have traditionally drawn on large patient bases to provide a rich environment for education and the integration of didactic material with clinical experience. These patient bases were sustained by factors such as traditional referral patterns, unique availability of services, reputation/excellence of patient care, location, or patient choice (including lack of alternatives or "no choice"). With the transformation of the health care market, particularly the introduction of capitated programs offering discounted services and choice of provider, both privately-insured and publicly-funded patients have chosen to seek care elsewhere. Conversely patients who lack financial resources or those with limited reimbursement for services, frequently rely on teaching institutions. These centers also provide high-intensity specialist services that are needed by the community but are relatively unprofitable to other hospitals or clinics. Medical students and residents are likely, therefore, to encounter smaller and less diverse patient populations. Residency patient populations are increasingly skewed towards the indigent (Bethea, Singh, Pobst, 1996) or patients with unique health needs only treated at a teaching hospital. Conversely, teaching institutions are less and less likely to serve the patient populations representative of those belonging to managed care and other evolving health systems. The shifts in patient populations pose significant problems for teaching institutions seeking to fulfill their mandates and missions to prepare physicians appropriately for future practice. As summarized by Schroeder in 1987:

> *"As an unintended result of powerful societal changes in the organization and delivery of medical care, the old model of education in a hospital-based system has been made less appropriate as the exclusive site for clinical education."*

The challenges to the educational mission are obviously significant, but the changes in patient populations and related factors are so pervasive and of such a magnitude that they impact the structure and financial viability of teaching institutions. As teaching institutions lose certain patient groups and attract those rejected by other systems, the long-standing societal responsibilities for patient care of the most vulnerable patients jeopardize the financial

support for educational and other missions. The "historically mutually beneficial relationship" (Houpt, Goode, Anderson et al, 1997) between the clinical, teaching, and research missions is hard to maintain and, in the current climate, these three missions are often at odds with one another and economic realities. Declining patient bases in a highly competitive and cost conscious marketplace place even the most prestigious institutions in jeopardy. The economic advantage of hospitals with no teaching mission has been documented for over a decade (Cameron, 1985) and was recently estimated to be as high as 35% per admission even with adjustment for case-mix (Blumenthal, Meyer, 1996). In ambulatory care, physicians in the community, many of whom have been trained at nearby teaching hospitals, provide many of the same services at lower cost than their academic counterparts.

Teaching institutions are being fundamentally altered by the revolutionary changes occurring in health care markets. Paradoxically, the forces that have shaped the current health care climate have also been those that have most hindered responses by education programs (Vanselow, Karalewski 1986). The health care industry, by creating a more competitive marketplace, has had an adverse impact on the clinical revenue of academic medical centers and faculty practice plans. Declining clinical revenues have, in their turn, reduced the resources available to subsidize research and teaching (Jones, Sanderson, 1996). As a consequence, physician faculty have found it necessary to devote more time to clinical activities and correspondingly less time to teaching and research. During this same time period, financial support from other sources such as State funding, tuition, endowments and research grants has not significantly increased for most teaching institutions (Jones, Ganem, Wiliams, Krakower, 1998). Although new funding for research has been generated in some institutions through relationships with industrial partners (Blumenthal, 1996), there is evidence that high levels of industrial support are associated with reduced academic activity (Blumenthal, Campbell, Causino, Louis, 1996). In the face of such severe economic strictures, the capacity to devote resources to educational programs has been questioned (Fogelman, Goode, Behrens et al 1996/Houpt, Goode, Anderson et al 1997), and the ability to provide quality in undergraduate and graduate programs may be compromised (Rivo, Mays, Katzoff, Kindig, 1995). Although there is substantial variation between institutions, all studies verify the continued dependence of medical schools on faculty-generated revenue and the current constraints on academic and other enterprises due to adverse market forces (Jones, Ganem, Williams, Krakower, 1998).

Faced with substantial educational challenges and decreasing and/or inappropriate resources to develop programs, teaching institutions have adopted a variety of strategies to preserve patient bases for education and other endeavors (Fogelman et al, 1996). A new appreciation of the potential of volunteer faculty and community-based locations to complement the experiences available in teaching hospitals is a common theme in the recent literature (Fogeleman et al, 1996/Houpt et al, 1997). This trend has also enhanced interest in distance learning and methods to make didactic curricular elements "portable" for use by learners at community sites. Several programs have been developed which provide examples of successful partnerships between medical schools and managed care organizations for the purpose of educating medical students and residents (Stevens, Leach, Warden, Cherniak, 1996/ Moore, Inui, Ludden, Schoenbaum, 1994). A study in 1996 estimated that about 85% of medical schools potentially exposed students to some form of managed care during required clinical experiences and that 16% of schools required experiences in staff/group model HMOs. (Veloski, Barzansky, Nash et al, 1996). This council in its Sixth Report (1995) recommended that undergraduate and GME programs expand their involvement with managed care organizations.

Although teaching institutions are developing new models of clinical care internally and building new partnerships for education, current learners and their teachers are caught in the transition from traditional to new models. The gap between the programs that prepare learners and the realities of the new medical practice environment does not appear to be closing. Four factors seem to be confounding attempts to close this gap:

- **The pace of change in the practice environment;**
- **The lag between the introduction of changes in educational programs and their impact on the practice of medicine (due to the 7-10 year span of training);**
- **The rate of response of medical schools and residency training programs to necessary curriculum change; and**
- **The lack of available resources to support needed change.**

Reference has already been made to the first two factors. The others reflect the interplay of organizational and financial disadvantages under which most teaching institutions operate. Teaching institutions are complex and inflexible business operations (Fox, Wasserman, 1993/Houpt et al,

1997/Fogelman et al, 1996) that often seek to fulfill their missions under legislative, social, and political constraints which hamper their ability to respond to change (Allcorn, Winship, 1996). While they have an obligation to acknowledge and support their unique educational mission (Cohen, 1997), the leadership and faculties of medical schools are significantly hampered in so doing by financial systems in which distinct budgets for education are rarely identified.

Uncertainty about the attributable costs of education makes forecasting appropriate budgets for change almost impossible (Watson, 1997). Additional funding through Federal programs or from private foundations could assist in initiating new teaching programs but the long-term viability of educational activities depends on sustained internal fiscal support. In the current climate, it is hard to argue for an increase in funding from tuition, or from State or Federal sources. In graduate medical education, the role of managed care organizations and other potential employers of resident physicians in providing funding remain controversial (Gold, 1996). A redistribution of existing resources, particularly for graduate medical education which is currently strongly linked to hospital service, has been advocated (Kassirer, 1996). Although this is a significant step, widespread curricular reform is unlikely unless educational budgets are developed, funds are generated or reallocated, and systems are established to monitor financial and other "business" aspects of medical education.

This is no small agenda for teaching institutions that are under increasing economic pressure on many fronts and may feel abandoned by the communities and populations they have traditionally served. It is equally daunting to faculty who are experiencing escalating conflicts in their roles in teaching, research, administration, and clinical care. Support may be forthcoming from public and other stakeholders. In particular, licensing and accreditation bodies may need to review their requirements and add those that promote the acquisition of new clinical knowledge and skills needed for 21st century medical practice (Rivo, Mays, Katzoff, Kindig, 1995). They may also need to exert pressure for greater clarity and accountability in medical education.

There is a pressing need for physicians whose education has prepared them to practice in the new healthcare environment. The decade-long lag between the introduction of new educational programs and their impact on the practice of medicine in the community gives rise to a sense of urgency in this report. In keeping with the scope and pace of change, fundamental and extensive changes in medical education are recommended; however, it must be stressed that such changes are in the tradition of U.S. medical education. Teaching institutions have been in the vanguard of major trends in the medical sciences and practice for over a century (Krauss, Smith, 1997/Pardes, 1997) and rightfully claim the intellectual leadership in preparing future physicians. When confronted with change in the past, they have coped and emerged as strong institutions. Their ability to do so will be repeatedly tested (Griner, Blumenthal, 1998). This report emphasizes the magnitude of the change posed by the tumultuous health care market and establishes key issues in how changes should be implemented and sustained if the population is to be appropriately served by its physicians.

Medical Education Programs for a Changing Environment

The international reputation for excellence of American medicine is, in no small part, due to the quality of its educational programs. This report does not challenge the tradition of quality in graduate medical education but seeks to strengthen it. The report argues for enhancement of existing programs through the inclusion of new program content, proposes dramatic changes in the faculty structure and roles, and advocates fresh approaches to clinical education. Excellence in the core disciplines of medicine will always be required and the basic scientific method is more important than ever in improving the quality of the nation's health. Nevertheless, new content must be integrated into our teaching programs and new teaching methods and settings must be explored in order to maintain the vigorous traditions of American medical education and its insistence on excellence. Adding to an already saturated curriculum is a difficult task requiring the prioritization and integration of both current and new material. Simply adding to educational mandates and responsibilities has always been unsatisfactory and may no longer be possible. This report advocates the reorganization and modification of current educational programs and the exploration of new strategies for medical education. It has as its objective, the development of programs that effectively prepare physicians for medical practice in the changing environment. These programs must meet or exceed current standards of educational excellence as they prepare residents to practice in the more systematic, quality-focused health systems of the future (Stevens, 1997).

Much of the curricular content of such programs has already been defined in the literature. As early as 1991, the Pew Health Professions Commission published a set of 17 competencies for the future health care practitioner (Shugars, O'Neil, Bader, 1991). Two comprehensive recent reviews (COGME 1997 Resource Paper "Preparing Learners for Practice in a Managed Care Environment", and Meyer, Potter, Gary, 1997) have developed core curricular domains that physicians need to master in order to function effectively in new practice environments, particularly managed care practice. These domains include:

- **Health systems financing, economics, organization, and delivery**
- **Practice of evidence-based, epidemiologically-sound medicine**
- **Ethics and the management of dual responsibilities and conflicts of interest**
- **Patient-provider relationships and communications**
- **Leadership, teamwork, and organizational change**
- **Quality measurement and improvement**
- **Systems based care**
- **Medical informatics and the obtaining, assessment, and use of medical information**
- **Teaching managed care**

In this report, the Council focuses on strategies for the integration of this content into medical training programs. Of the nine domains, two have been selected for special consideration. An understanding of the system in which the physician is providing care, and the ability to communicate effectively with patients, colleagues, and others are critical in today's medical practice and underpin the full development of the other domains.

The sections that follow contain eight findings and their associated recommendations that are the core of this report. They are grouped as follows:

I. Understanding the System in Which Health Care is Delivered

II. Establishing Practical and Relevant Teaching Sites

III. Developing Community Clinician Teachers

IV. Revising the Curriculum Content and Learning Process

V. Reinforcing Communication Skills

VI. Assuring Quality and Accountability in Physician Education

VII. Financing the Evolution of Graduate Medical Education

VIII. Sustaining Quality and Vitality in Medical Education.

While the findings and recommendations in this report focus on graduate medical education, COGME found it difficult, if not impossible, to uncouple medical student and resident education. We have chosen not to address the issue of fellowship

education directly, although the recommendations of the report should be extended to include fellowships. Currently the educational linkages between medical school and GME are tenuous. There is limited consensus on what aspects of the educational experience should be focused at the different stages of the process and little planned attempt to synergize learning or avoid unhelpful duplication during the long period of training. Medical education should be viewed as a continuum from premedical education, through medical school, residency and fellowship training, and into medical practice and continuing medical education. The current artificial division of physician education into disconnected phases has contributed to some of the problems identified here. The lack of continuity is manifest at all stages of the training process—between (and even within) courses during medical school, in the transition to residency, and in establishing and maintaining lifelong practice.

The fragmentation of the educational process has magnified the mismatch between the education of physicians and the demands of practice. A survey based on the 1991 Pew Commission competencies found that only 31% of practicing physicians reported adequate training to consider cost implications of patient care, 17% felt prepared to work in managed care settings, and 14% reported being well-prepared for increased scrutiny of practice standards (Finocchio, Bailiff, Grant, O'Neill, 1995).

This report is intended to clarify the need for, and to stimulate the development of, fresh approaches to the professional education of physicians for contemporary and future medical practice. It presents an analysis of the issues influencing the preparation of physicians and recommends changes in teaching programs. Unlike previous COGME reports which have focused on primary care, the recommendations in this report apply to preparation for many medical specialties. In particular, the importance of clinical education in the community is no longer limited to the primary care specialties. In many specialties, the community offers unique educational opportunities that are complementary to those of the academic health center or teaching hospital. The comprehensive preparation of all modern physicians requires experience in both traditional and community settings.

This report advocates the development of high-quality, community-based clinical teaching opportunities and a faculty incorporating community clinician teachers. It calls for expansion and enhancement of educational relationships with the community and a redefinition of the roles of conventional medical school and residency program faculty. In addition, the report emphasizes the role of rigorous evaluation systems to assure consistent quality and guide the steady evolution of educational systems. Finally, the report addresses strategies to fund and sustain the recommended changes.

I. UNDERSTANDING THE SYSTEM IN WHICH HEALTH CARE IS DELIVERED

FINDING 1. Physicians increasingly deliver health care to defined populations of patients in the context of integrated delivery systems or health plans. An improved understanding of the characteristics of the populations served and the attributes of the delivery systems is fundamental to effective medical practice.

Many patients now receive health care as part of a system that involves physicians, other health professionals, hospitals, community resources, and a health plan. The resources available to patients through a health plan or an integrated health care delivery system are often comprehensive; cost-effective care is, however, a major theme in almost all health care delivery systems and health insurance plans. Restrictions are usually placed on when and how plan-funded services can be used. Controlling and monitoring access to services is frequently the role of the plan medical director. Although this role may be perceived as adversarial to colleagues involved in direct patient care, medical directors are physicians with expertise in the health plan and can be invaluable consultants assisting physicians in providing high-quality, cost-effective care specific to patients' needs.

Effective medical practice within a health care system requires communication skills (see Section V), effective teamwork built on a clear understanding of the roles and capabilities of other health professionals, and constructive use of the plan's resources and management systems. In order to provide the highest quality care and to be advocates for their patients, physicians must thoroughly understand the benefits and limitations of each plan and the characteristics of the system in which care is delivered.

Many residency programs have taken steps to provide experience in health care financing, practice management, and managed care practice. Residency programs established within HMOs and other managed care organizations are relatively uncommon but most residents interact with patients who are members of pre-paid plans in residency clinics/hospitals or during elective experiences. Managed care Medicaid programs are being introduced in a

number of States, and may provide residents with an opportunity to care for capitated patients in the hospital and outpatient clinic. In spite of these developments, both residency graduates and the managed care organizations that they join, currently recognize the lack of understanding of the system in which they provide healthcare as a barrier to immediate effectiveness (Gold, 1996). In this and several other key areas, executives of managed care organizations have called for far-reaching changes in residency curricula to better prepare graduates for practice (Jacobs, Mott, 1987/Meyer, Potter, Gary, 1997). A recent survey of Internal Medicine residents concluded that exposure to managed care during residency training influences attitudes towards acceptance of managed care and career choices towards generalism (Nelson, Matthews, Patrizio, Cooney, 1998).

Appropriate preparation in systems of health care delivery goes beyond learning about policies, procedures and organizational structure. Physicians must learn how to optimize the different systems for the benefit of their patients and their own sense of professional satisfaction. With the advent of managed care, the relationship between physicians and their patients has changed. Under the fee-for-service system, open-ended contracts with health insurers permitted physicians to make patient management decisions that were not influenced by the considerations commonly found in managed care programs. Today, many physicians provide care for panels of patients who subscribe to a myriad of different plans, each with different benefits, restrictions, and operational systems. Physicians are often placed in the uncomfortable role of explaining to patients, who may be employees of the same company or even members of the same family, why they are not entitled to the same benefits as other patients with the same health status. Conversely, the population-based approach of health plans provides opportunities to enhance the quality of care by providing physicians with data on the characteristics of the patient population, the medical problems that are more likely to occur in its members, and collaboration in health promotion/disease prevention measures such as screening.

In common with other topics and skills described in this report, learning about the system in which physicians practice is best accomplished through a combination of theoretical studies and practical experiences. Intensive short didactic courses on aspects of managed care may have limited long-term educational impact on residents (Lazarus, Foulke, Bell et al, 1998). The emphasis on experiential learning in residency training supports the direct involvement of residents both in patient care and in processes such as quality assurance and utilization review that are integral to managed care organizations. Similarly, experiential learning provides opportunities to work with other health professionals to learn about their training and capabilities, and their role in the clinical team. The content and format of educational programs to enhance understanding of health care systems must be made specific to the stage of medical education, tempered by the predominant form(s) of local health care systems. This may range from general overviews for first year medical students to details of credentialing and contracting which are of great significance to senior residents. At all levels of training, the requirement to provide optimal patient care in the context of the system must be paramount.

Recommendations:

- **Medical students and residents should learn the basic principles of health care financing, the benefits and limitations of typical health plans, and the characteristics of the systems in which health care may be delivered.**
- **The curricula of medical schools and residency training programs should include clinical learning experiences in the setting of each of the components of an integrated health care delivery system**
- **Medical schools and residency training programs should provide opportunities for medical students and residents to learn the contribution of other health professionals to the care of their patients, and augment opportunities for learners to participate in a team approach to patient care.**
- **Educational programs for medical students and residents should address the care of the individual patient in the context of the population or community of which the patient is a member.**

II. ESTABLISHING PRACTICAL AND RELEVANT TEACHING SITES

FINDING 2. There will be an acceleration in the development of new models of medical education that reflect more closely the practice of medicine within evolving health systems.

Academic health centers (AHCs) and teaching hospitals provide excellent training sites for many

aspects of medical education. Indeed for certain aspects of clinical learning, the classical AHC is the only environment which brings together the expertise, selected patients, and the equipment and other resources necessary for education. It is, however, very difficult in the AHC environment to expose students and residents to the patient mix, clinical situations, pace and time issues, practice management concerns, interdisciplinary collaboration, and physician role models which are prevalent in the community. (Schroeder, 1988) Without such exposure, learners are handicapped in developing the skills, knowledge and attitudes needed for future practice. It is therefore incumbent on training programs to include appropriate "non-traditional" experiences that complement the AHC and teaching hospital components to provide a comprehensive clinical education. In developing this comprehensive approach, consideration must also be given to ensuring patient populations which appropriately represent the community diversity in characteristics such as ethnic origin, socioeconomic status, age, and gender. (Residency training in some specialties such as pediatrics, geriatrics, and obstetrics/gynecology should strive for diversity within their scope of practice.)

The national trend in medical education is towards the attainment of generalist competencies by the time of graduation from medical school. These objectives are not well served by the specialty-skewed environment of a classic AHC. Many, if not most, medical schools have acknowledged this by creating generalist and other ambulatory experiences within the AHC and developing new opportunities away from the AHC for medical students and residents (Cope, Sherman, Robbins, 1996/ Carlton, Weston, 1997). They have accepted the organizational and other challenges of the ambulatory setting for resident education, recognizing that the unique opportunities of the environment require new models of graduate education (Wartman, O'Sullivan, Cyr 1992). A variety of strategies have been used to establish a presence in the community (Urbina, Hickey, McHarney-Brown et al, 1994/ Fogleman et al 1996). Some of these strategies originated in, or were influenced by, a need to secure patient populations to support the clinical enterprise of the academic health center. In these cases, the operational systems of the clinics may not explicitly facilitate education, but all community activity should be seriously considered for its potential role in the education of students and residents.

The established method of experiential learning in GME works particularly well when it closely parallels future practice settings. The selection of appropriate settings for learning is therefore critical. Such settings are more likely to be found in the community than in the academic medical center (Hayashi, Hayden, Yager, Gauze, 1989/Cope et al, 1996/Perkoff, 1986/Parenti, Moldow, 1995). As medical education has always depended on immersing the learner in the work environment as a member of a team dedicated to patient care, the commitment on the part of community sites to participate in the education of medical students and residents is considerable. A quality educational experience demands the investment of time and resources by community physicians and staff to work with medical school and residency faculty in the development, implementation, and evaluation of learning experiences. Community sites are partners and stakeholders in an educational process rather than simply locations of an educational activity (Tallia, Micek-Galinat, Formica, 1996). The characteristics of a quality community teaching site include:

- **The practice of the highest possible quality of medicine in an environment that is relevant to current daily practice;**
- **The presence of expert clinician teachers who are practicing the highest possible quality of medicine;**
- **The availability of experiences that are appropriate to the stage of training of the learners and enable them to achieve educational objectives of the curriculum; and**
- **The presence of clinicians who are prepared to devote the time and attention to the learning experience for students and residents.**

Of central concern in community settings is the need to provide medical education that is of high quality and appropriate to the future practice of the learner. Each location in which education is conducted requires individualized preparation, development, and monitoring to fully exploit its educational potential (Lemon, Greer, Siegel, 1994/ Crump, Chambers, Bolt, 1996). The importance of these steps and the resources needed to carry them out have been underestimated by many involved in medical education (Ricer, Filak, David, 1998). Traditionally, medical schools and residency programs have made relatively informal arrangements for students and residents at community sites, often based on relationships with program graduates and the willingness of community physicians to volunteer. A comprehensive assessment of the quality and scope of the medical practice or the ability of the physicians and other staff to teach is rarely conducted. The increasing significance of community-based education has led to more formal agreements and, in some locations, the development of

educational consortia to bring together entities for clinical teaching. Although the costs are enormous, some institutions have provided new learning environments by direct acquisition or development of AHC-owned clinical facilities in the community.

The introduction of learners into any community site requires careful consideration of strategies to anticipate and minimize any negative effects while optimizing the positive aspects of participation in teaching. The principal concerns are usually the slowing of patient flow with its subsequent effect on clinical income, and perceptions that patients dislike learners participating in clinical encounters. Studies indicate that the time required to teach while seeing patients in a private office varies enormously depending principally on the educational stage of the learner and characteristics of the teacher (Vinson, Padden, Devera-Sales, 1996/ Ricer,Van Horne, Filak, 1997). Although it appears intuitive, time spent teaching may not directly equate to diminished clinical revenue. The few studies which have attempted to detect changes in productivity and other financial outcomes due to teaching have given mixed results (Kearl, Mainous, 1993/ Garg, Boero, Christiansen, Booher, 1991/McKee, Steiner-Grossman, Burton, Mulvihill, 1998/Fields, Toffler, Bledsoe, 1994/ Heath, Beatty, 1998). It appears that experienced teachers in ambulatory clinics have devised strategies to maintain clinical productivity and income through a combination of specific teaching techniques and use of "private time" such as during meal breaks or after hours for direct interaction with learners. Much of the research has concerned medical students. Although estimates of $6,000-$18,000 per year have been made of the cost of training a resident in community sites (Zweifler, Rodnick, 1998), a widespread belief exists that graduate medical education is a "break even" or potential financially positive activity, very dependent on the seniority of the resident (Rosborough, 1998/Gold, 1996). The financing of resident education in the community is extremely complex (Burg, Kelly, Zervanos 1994) and certainly merits further study (Xakellis, Gjerde, 1995/Bordage, Burack, Irby, Stritter, 1998).

The perception that patients will not accept the active participation of students or residents in their care is relatively common but generally inaccurate (Tamblyn 1994/O'Malley, Omori, Landry, et al, 1997). The majority of patients are positive about the involvement of learners, particularly when designation as a teaching site is seen as an indicator of high quality practice. Although some patients do not want to be seen by learners and others want time alone with their physician, many are comfortable participants in clinical teaching when simple courtesy is extended. The opportunity to decline the involvement of students and residents must always be offered (Simons, Imboden, Martel, 1995/ Magrane, Gannon, Miller, 1994/ O'Flynn, Spencer, Jones, 1997). Improved patient satisfaction has been cited as an incentive for HMOs to participate in meical education (Kitz, Larsen, 1997).

Learners also require preparation in order to maximize their education in community sites. The student or resident who has learned to function effectively in the AHC may find the transition to a community site stressful and disorienting. They may fear isolation from other learners and may be required to travel considerable distances from home. Community placements usually require learners to take greater responsibility for their own studying, to act professionally in a situation where the primary purpose is patient care, interact with staff and other health professionals, and have a very different relationship with teachers than previously. Experience in a community site may be a powerful counter to the "hidden curriculum" or institutional acculturation often cited as a negative influence on the professional development of physicians (Hafferty, 1998). Learning in a community office may be different in style (Epstein, Cole, Gawinski, et al, 1998) as well as clinical content (Gjerde, Levy, Xalellis, 1998) from the experience in a residency or medical school clinic. Even didactic aspects of learning may be different such as use of distance learning modalities and an emphasis on personal study and completion of projects as opposed to attending lectures and working with other learners. Clear expectations should be set out during the orientation to the program both at the medical school or residency program and "on site." High levels of administrative support and coordination are required to optimize the learning opportunities of community sites even for residents.

The importance of clinical education in the community is not limited to the primary care specialties. In many aspects of surgery, obstetrics and gynecology, psychiatry and other specialties, the community provides educational opportunities that are complementary to those of the academic health center. Community sites offer experiences that are both practical and relevant to the educational needs of the student or resident. This does not imply that all clinical learning should be moved into the community, but in many instances community sites provide essential experiences that are not available in the clinics of AHCs. The comprehensive training of modern physicians for all specialties requires experience in both AHCs and community sites.

The content and relative proportion of experiences gained in different environments during the

educational process must be decided by each institution, but the educational value of community experiences can no longer be questioned. Learners who are placed in such environments are reported to have equivalent results on formal testing when compared to students educated more conventionally (Fincher, Case, Ripkey, Swanson, 1997/Irby, 1995/Steiner, Cook, Smith, Curtis, 1998). They are also reported to have greater confidence in aspects of communication and patient assessment as well as a tendency to greater self-reliance in study habits (Irby, 1995). Medical education must enable students and residents to learn in multiple and diverse situations, including the wards, operating rooms, clinics and laboratories of the classical AHC; but to provide a well-balanced spectrum of learning experiences, the proportion of time spent in community sites such as private offices, managed care facilities, public clinics, community agencies, and community hospitals should, in almost all cases, be increased.

Several successful community-teaching programs have already been developed. The WWAMI program at the University of Washington is an example of a teaching program incorporating selected teaching practices distributed across five States (Washington, Wyoming, Alaska, Montana and Idaho) that offer community-based clinical learning opportunities for students and residents. Several of the teaching practices that participate in the WWAMI program have done so for 20 years or more. Similar programs exist at the University of Minnesota, Marshall and West Virginia Universities, the University of Kansas-Wichita, and the State University of New York, Syracuse.

More recently, the Health Resources and Services Administration has funded a five-year project entitled "Undergraduate Medical Education for the 21st Century (UME-21): A Demonstration of Curriculum Innovations to Keep Pace with a Changing Health Care Environment." The goal of this project is to demonstrate that medical schools, in partnership with managed care and other organizations and institutions, can provide educational opportunities to better prepare graduates to practice high quality, population-based, cost-effective medicine (Wood, 1998). In addition, under the aegis of Partnerships for Quality Education (PQE), a three year initiative funded by The Pew Charitable Trusts, 66 partnerships between academic health centers and managed care organizations are developing residency training experiences in managed care settings (PQE, 1998; personal communication, Gordon T. Moore, 1998). The partnership between teaching institutions and managed care organizations is perceived to be mutually beneficial providing educational experiences to the medical school and offering the managed care partner a role in the education of students and residents who may become future staff physicians—but the interactions are complex. By one estimate over half of Internal Medicine residency programs place residents in private physicians' offices for at least a portion of training and this proportion is increasing rapidly (Swing, Vasilias, 1997). Over 90% of medical schools use community preceptors, predominately family physicians teaching third and fourth year students, but increasingly in diverse roles and throughout the curriculum (Fields, Usatine, Stearns, Toffler, Vinson, 1998).

Medical schools, residency programs, and their accrediting organizations are rightfully concerned about quality and consistency of clinical experiences for medical students and residents across multiple sites in the community. Careful site selection, faculty development, and rigorous evaluation with feedback are essential. These, and the importance of an adequate time placement, well-planned to ensure continuity and substantial patient contact, have recently been reviewed (Irby, 1995). Distance learning technology (discussed later in this report) and other methods have been developed to enable the didactic aspects of the curriculum to be delivered consistently to learners and community clinicians. This concept has been extended to all aspects of education as "the Virtual Clinical Campus" (Friedman, 1996). Less dramatically, the new emphases on performance assessment of learners and evaluation of educational programs provide monitoring and quality enhancement techniques which enable medical educators to explore the opportunities of unconventional sites with confidence that excellence is not being compromised. Indeed it has been stated that community-based experiences have been more thoroughly evaluated than any other aspect of medical education.

Recommendations:

- **Clinical education should occur in settings that are representative of the environment in which graduates will eventually practice. Medical schools and residency training programs should develop or acquire clinical teaching sites that offer the best learning opportunities and the highest standards of clinical practice. Partnerships with integrated delivery systems, health plans and other organizations should be developed as one strategy to accomplish this.**
- **Medical educators should exploit the potential of distance learning technology to**

deliver educational programs in which instruction and evaluation are of a consistent and high standard to multiple settings in the community.

III. DEVELOPING COMMUNITY CLINICIAN TEACHERS

FINDING 3: The selection and support of clinician teachers in the community will become a fundamental priority of medical schools and residency training programs. The current roles of faculty members based at conventional teaching institutions will be significantly changed by expanded concepts of medical education and more inclusive definitions of faculty membership.

The importance of the teacher has been overshadowed recently in medical education by a focus on curricular content. In clinical environments the best teachers are expert clinicians who teach by example and model the professional characteristics that students and residents should emulate (Irby, 1995). In the process of teaching, they provide factual information and demonstrate technical skills, but above all, they share the clinical problem-solving, integration, and communication skills essential to patient care. Faculty at AHCs and teaching hospitals are often superb clinical teachers who have limited contact with students and residents because of competing demands on their time from research, administration and service commitments. In these situations, residents are commonly given the responsibility for much of the clinical teaching of students. Residents lack the breadth of experience to be satisfactory role models for learners and are often pre-occupied with the demands of in-patient care. Conversely, although busy in patient care, the daily activities of community physicians are focused on the factors already identified as essential to prepare future physicians. Highly effective clinician teachers and excellent role models for students and residents should therefore be sought among community physicians. This report advocates the mobilization of community faculty to an extent not previously attempted both in numbers and in the strength of the relationship with medical schools and residency programs.

Who should be selected for this teaching role? They must be, first and foremost, experts in their field who practice in environments that are representative of their specialties. They must be physicians who, by the evaluation of their peers and other criteria, are identified as the best clinicians in the community. Although not necessarily trained as educators, they should have a passion for the role and be willing to participate in faculty development activities. Community teachers should be involved in both the medical and wider community so learners may experience the realities of daily medical practice and the lifestyle of a community physician. This implies that the community teacher should be willing to share personal experiences, attitudes and other insights with learners creating a very different level of teacher-learner relationship than usually exists in medical education. Above all, they must be willing partners with faculty based at the teaching institution and other community teachers in a dynamic educational system that is responsive to changes in the practice of medicine and committed to the optimal preparation of future physicians.

Community physicians who currently volunteer to teach often have a limited understanding of the objectives of the learning experience for students or residents and the criteria used to evaluate the performance of learners and teachers. This may occur because of geographic distance from the medical school or residency program, limited contact with program coordinators, or a lack of involvement in program development. Simply recruiting community physicians to teach is not sufficient. Course directors must understand the abilities of each community teacher and the extent to which those match curricular requirements. Each potential teacher possesses a range of knowledge, skills, and attitudes determined by factors such as the nature of the medical practice and the interests and aptitude of the individual physician. Where gaps occur in the teacher's experience or skills, or there is a mismatch with curricular objectives, supplementary experiences must be found for learners and/or opportunities provided for teachers to develop or refine skills (Skeff, Bowen, Irby, 1997). Arrangements must be made to continuously monitor and improve teaching effectiveness over time (Schuster, Haggerty, 1994/ DeWitt, Goldberg, Roberts, 1993). It is anticipated that students and residents in the future will work with multiple community teachers. Ensuring a comprehensive range of experiences for learners will become a major role for course and residency program directors. Extremely good communication among members of a diverse faculty team will be essential (Reynolds, Giardino, Onady, Sieigler, 1994).

All educators must be prepared for and supported in their teaching roles. For community practitioners, teaching skills development is a crucial activity (Skeff, Stratos, Mygdal et al, 1997). The teaching skills necessary to function in the ambulatory environment are different from those needed

in the in-patient setting but techniques to maximize the educational value of brief teaching encounters have been described for both students and residents (McGee, Irby,1997/Ferenchick, Simpson, Blackman et al, 1997/Neber,Gordon, Meyer, Stevens, 1992/ Lesky, Borkan, 1989). Well-designed faculty development programs can assist faculty to master the different components of the teaching role. Faculty development must, however, be built on assessment of the needs of individual teachers. Aspects such as evaluation and providing feedback to learners are often particularly troubling to community teachers because of the very intimate relationship with learners. Significant, continuous investment in faculty development is essential to ensure that the quality of teaching in the community meets acceptable standards (Quirk, DeWit, Lasser et al, 1998).

The insistence on quality and an ability to measure it distinguish the community teachers advocated in this report from those of the pre-Flexnerian era. Medical education during that era was justifiably criticized for its variability in quality and lack of academic rigor. Many students of medicine were apprenticed to physicians who were themselves poorly and unscientifically trained and were inappropriate role models. Since then the term "apprenticeship" has acquired a pejorative connotation in medicine and education outside the AHC or teaching hospital has been regarded as of dubious quality. It is time to challenge these beliefs and advocate a return to significant community-based education to complement the in-patient emphasis of the AHC. Sophisticated systems to credential physicians based on clinical performance are now availabie (Nash, Markson, Howell, Hildreth, 1993) and the assessment of teaching skills has become more refined and standardized. Such techniques provide medical schools and residency training programs with the ability to select and maintain community faculty who are experts in their clinical fields and offer the best in clinical teaching. New insights in medical education support the confidence of many educators that community based faculty can provide the best of classical "apprenticeship" and "mentoring" approaches. Individual residents or medical students can be assigned for high quality clinical experiences and for a major proportion of their clinical education to clinician-teachers in community practices (Verby, 1988, 1991). With scrupulous attention to the attainment of defined standards of teaching and learning, the apprenticeship holds renewed promise as a viable, practical, and rigorous educational experience.

For community physicians to play their full role in clinical teaching, they must be appropriately prepared, rewarded, and sustained. This implies a degree of commitment and support from the medical school and residency-training program that is currently provided in only a few locations. In order to recognize the value and ensure accountability for the quality of their teaching activities, community clinician teachers should be paid and otherwise rewarded. The time has passed when altruism and enthusiasm alone can be the foundation of a large component of professional education. The role that community clinician teachers will fill in the education of physicians is too important to be assumed by volunteers. Community teachers must be directly rewarded (Fields, Usatine, Stearns, Toffler, Vinson, 1998). The system of rewards must be clear and related to measures of commitment and quality. The specific form of rewards should be determined by each institution, incorporating input from the community teachers themselves as to what constitutes appropriate "value" in recognition of their efforts and achievements (Bell, Frey, 1998/Gray, Fine, 1997/ Fulkerson, Wang-Cheng, 1997). At a minimum, the reward system should incorporate:

- **Direct payments;**
- **"In kind" benefits such as continuing medical education credits and access to university facilities and services;**
- **Appreciation and recognition functions;**
- **Participation in a promotion process that recognizes teaching, service and scholarship; and**
- **Ability to participate in the on-going devlopment of educational programs**

The later is proposed in full appreciation of its implications for traditional teaching institutions. Since community teachers will be responsible for a significant portion of the clinical teaching mission of the medical school or residency program, they should understand the mission and participate in its development, implementation, and evolution. Their contributions should be sought and valued. Conversely, sustaining educational standards and enthusiasm will be enhanced if community-based teachers perceive themselves to provide more than "clinical material". The required degree of quality control and commitment can be achieved only through true collaboration (Lemon, Yonke, Roe, Foley, 1995).

New levels of partnership with the teaching institutions should extend to academic promotion systems. A recent survey revealed that even in clinician-educator academic tracks, the number of publications remained an influential determinant of promotion (Beasley, 1997). While classical

scholarly work should not be discouraged, academic promotional policies should be developed to accommodate clinician teachers, including those based in the community. The criteria for academic promotion for such faculty should be based on their achievements in their specific roles and measure scholarship in broadly-defined terms appropriate to these responsibilities (Boyer, 1990).

The creation of a cadre of community clinician teachers will substantially change the role of full-time medical school and residency program faculty. While they will remain committed to the direct teaching of medical students and residents, proportionately greater amounts of time and effort are likely to be required for program design, evaluation, management, and development. Traditional faculty members based at the AHCs and residency training programs are likely to require more sophisticated skills in the design, management and evaluation of educational programs, as well as in leadership, communication and other attributes in order to lead increasingly complex educational systems. The criteria for academic promotion for such faculty should reflect achievements and scholarship appropriate to these responsibilities. More sophisticated and reliable measures of "service" as well as educational aspects of the faculty role will be needed in order to ensure that those faculty members who devote their careers to education are not disadvantaged in academic promotion and incentive payment/ reward systems.

In addition to physician faculty, medical schools and residency programs need to consider appropriate roles for professionals from educational backgrounds and the enhanced personnel and organizational systems required to support a network of community-based faculty integrated with those based at traditional sites. To assure that educational standards are met, evaluation criteria are consistently applied, and teaching performance is continuously evaluated and rewarded in complex successful systems will require moving beyond the traditional reliance on one or two dedicated faculty members and a course secretary.

Recommendations:

- **Medical schools and residency training programs should recruit and support community clinician teachers. Faculty members at community teaching sites should be selected for the quality of their medical practice and the excellence of their teaching. They should be paid and otherwise rewarded for their educational activities. Teaching institutions should develop mechanisms to involve community faculty in the design and operation of educational programs.**
- **Medical school and residency faculty should complement their skills as teachers of students and residents with competencies in faculty development and the management of educational programs in the community.**
- **Residency training programs should take the lead in the development of rigorous practice-based models of graduate medical education in which individual or limited numbers of residents are assigned to physicians in community teaching practices.**

IV. REVISING THE CURRICULUM CONTENT AND LEARNING PROCESS

FINDING 4: The transformation of the health care environment created by changing demographics, mechanisms of health care financing, and a focus on prevention and wellness, has a profound effect on the practice of medicine. Reflecting these changes in educational programs that prepare medical students and residents for their future roles requires innovative strategies and new resources.

The transformation of health care has created opportunities and challenges for medical educators (Cohen, 1995). Recent changes in medical practice have stimulated the introduction of new topics and the expansion of existing components in the curriculum, particularly in areas such as ethics, evidence-based medicine, cost-effectiveness, nutrition, wellness and disease prevention. The changing demographics of the population have also created a need for a greater level of cross-cultural awareness among the graduates of residency training programs. Fundamental understandings of the objectives of residency preparation (STFM Task Force on training residents for the future, 1986/ Burke, Baron, Lemon et al, 1994/ Noble, Bithoney, MacDonald et al, 1994) have been revisited and updated due to the extent and pace of recent changes, particularly the impact of managed care.

The content that should be added to the curriculum of medical schools and graduate training programs because of managed care is summarized in the nine domains found on page 7 of this report.

They incorporate most of the topics and skills to be found in other managed care curriculum descriptions. Differences between recommendations for curricula may reflect problems in the scope and definition of terms as well as controversies over the relative priorities of topics. For example, "the practice of evidence-based medicine and population-based medicine" (Greenlick, 1992) are frequently recommended for addition to the curriculum but could be implied from the nine domains listed. Similar statements could be made concerning "the practice of cost effective health care, the application of principles of community medicine and public health to medical practice, and an understanding of the system in which health care is delivered." Precise definitions of terms, and uncertainty concerning appropriate learning strategies are particular issues for other recommended topics such as "teamwork skills," "quality measurement," and "patient advocacy." The nine domains previously listed provide a reasonable basis for comprehensive preparation for modern practice. Although the changing practice of medicine requires that educators continually adapt the specific content of training programs, the concepts encompassed by these nine domains are likely to endure and become increasingly pervasive in medical education and practice.

Curricular components that address these domains have been introduced in many training programs. While some educators advocate integration of the new material into standard curricular designs and others have called for dramatic changes in medical education, the involvement of community sites features in almost all proposals for the education of future physicians.

The development of community teaching sites offers opportunities to present curricular material in "real world" settings using a range of formats. Besides organizational complexity, the greatest concerns have been those of quality and consistency. In particular, the extension of teaching into the community setting requires creative approaches to deliver curricula to residents who are dispersed among multiple community sites. Distance learning technology offers a potential solution (Spann, 1998/ Lewis, Bredfeldt, Strode, D'Arezzo, 1998). Medical schools and residency training programs are exploiting the Internet and other technologies for communication and educational purposes. In addition to administrative functions (such as posting schedules or routing communication) many use technology to conduct learning sessions, provide learners with exercises and resources, or conduct examinations. Telemedicine can be used in clinical as well as didactic instruction (Crump, Pfeil, 1995/ Crump, Tesson, Montero, 1997). These uses of technology in education, administration, and communication are well-established at many teaching institutions to support "on campus" activities and extension to community sites is increasing. A recent paper describes the application of a comprehensive "intranet" system to enhance communication, administration, education, and other aspects of GME across multiple sites (Zucker, White, Fabri, Khonsari, 1998). The widespread use of technology will only fulfill its potential in education if all participants are comfortable with the necessary technology as well as proficient in its use. Support services have to accommodate "cultural" as well as technological issues (Friedman, Corn, Krumrey et al, 1998).

Major changes in educational programs cannot be recommended without establishing mechanisms to monitor effectiveness and ensure consistent quality over place and time (Tallia, Micek-Galinat, Formica, 1996). As mentioned in previous sections, the teaching and testing of knowledge and skills of residents medicine has undergone enormous change in the last decade (Gray,1996). In addition to advances in educational psychometrics (particularly the more effective use of examination formats), the use of standardized patients to simulate patient encounters and multiple-station skills tests, represent significant advances in the teaching and testing of clinical competencies. Several medical schools have participated in consortia to develop standardized patient training programs, and to share scripts and other materials. Rating scales and scoring systems have been developed, tested and validated to the extent that the National Board of Medical Examiners is planning to adopt this methodology, which has already been used in licensing in Canada (Reznick, Blackmore, Dauphinee et al, 1996). The Canadian and other studies demonstrate conclusively that it can be used effectively for teaching and/or testing at multiple sites. It is, therefore, a powerful addition to the ability to standardize teaching and evaluation at community sites.

Distance learning technology, standardized patients, clinical skills testing techniques and other educational advances are changing the way in which students and residents are educated and evaluated. These methodologies have the potential to revolutionize medical education since they offer the opportunity for students to learn and test at their own pace and in locations that more closely meet their educational needs. They offer the ability to create a curriculum that is "portable" and adaptable to the individual student and the unique educational environment; but one whose quality is monitored closely by program faculty, and whose outcome is

validated by the achievement of defined competencies. When integrated with appropriate faculty development, distance learning technology and standardized skills testing techniques permit faculty members to teach and evaluate learners as never before. The improvements in quality and consistency over time and place and between instructors, enable community teaching to be regarded as a true extension of, and complementary to, the programs offered at the teaching hospital. The unique learning opportunities of community sites can be integrated into the curriculum without jeopardizing educational quality.

Many medical schools and residency programs have already responded to calls for change in the education of students and residents. New topics and techniques have been introduced but few, if any, programs have taken a comprehensive approach. Constrained resources have been a factor. Indeed, many of the curriculum changes in medical education have been initiated through grants and contracts from Federal agencies and private foundations such as the Robert Wood Johnson Foundation, the Pew Charitable Trusts, the Kellogg Foundation, the Macy Foundation and the Culpepper Foundation. Examples include the Robert Wood Johnson "Generalist Initiative," the Bureau of Health Professions administration of Title VII programs (Politzer, 1997), and the "Interdisciplinary Generalist Clerkship" project (Wartman, Davis, Wilson et al, 1998). Without the availability of resources such as these, much less might have been accomplished.

In spite of these initiatives and changes, several recent reports have pointed out the discrepancy between the education of physicians and the knowledge, skills and attitudes required for successful practice (Finocchio, Bailiff, Grant, O'Neil, 1995). Graduates of residency training programs in the U.S. have been critical of their preparation for medical practice in the community, particularly in areas such as practice management, and the care of specific chronic conditions in community settings (Cantor, Baker, Huges, 1993). The health care industry has been equally critical of medical education (Gumbiner/Gold, 1996). Managed care organizations have identified shortcomings among newly-hired physicians, particularly in communication skills and the practice of cost-effective medicine. They advocate a much greater emphasis on primary care in the education of all physicians and are critical of the high proportion of graduates who select subspecialist careers.

As stated above, proposals for topics to be included in a curriculum which appropriately prepares graduates for managed care practice have been published. Much less has been published concerning how these topics should be integrated into the curricula of medical schools and residency training programs. Some of the elements of a managed care curriculum may already be present in the offerings of many medical schools and residency training programs. In such cases, coordination and integration of existing components are required to appropriately prepare graduates for practice. It is likely, however, that many institutions require extensive curriculum revision (of both content and format) in order to enable their graduates to achieve the competencies identified as essential for practice in contemporary and future environments. Again, this report emphasizes the need for access to a comprehensive range of traditional and non-traditional sites for medical education and the integration of didactic and practical experience in order to prepare a competent physician. Medical school and residency training program faculties should evaluate and revise current curricula to ensure that these topics are introduced at the appropriate time in the education of medical students and residents, and that they are given emphasis and reinforcement throughout the program. Many aspects of these domains can best be learned in non-AHC settings. Indeed, some topics can only be effectively taught and role-modeled in community practices or specific sites such as public health agencies or the administrative offices of health care delivery systems. As previously stated, a comprehensive medical education increasingly requires experience in a range of non-traditional learning environments. Some of these sites may not directly provide patient care and examples already exist of student and residency rotations in administrative offices of managed care organizations or public health officers.

It is anticipated that institutions will continue to develop different strategies to fulfill their mandates to appropriately educate physicians for future practice. The evolving significance of community sites is such a consistent and powerful theme that all educational models are expected to incorporate community experiences and in some institutions, such experiences could account for substantial portions of the curriculum. The expanded role of community-based education is likely to enhance other developments such as electronic and other non-traditional teaching methods, competency-based curricula, and standardization of testing and evaluation. The patient populations and clinical experiences provided by community sites are also likely to further accelerate changes in curricular content towards those domains identified as crucial to future practice environments. Within these domains, communication skills (Section V.) and understanding of health care delivery systems (Section I.) are perceived to be of particular significance.

Recommendations:

- **Medical schools and residency training programs should fundamentally revise the preparation of their graduates to reflect the changing practice environment while sustaining the quality of current teaching programs. They should emphasize disciplines that are basic to contemporary medical practice such as epidemiology and population-based care, health care policy and systems, disease prevention and wellness, and computer information skills.**
- **Educational programs must prepare physicians in ethical decision-making and advanced communication skills, including patient advocacy, conflict resolution, and teamwork to effectively serve patients in the new health care systems.**
- **Medical schools and residency training programs should accelerate the incorporation of advanced educational concepts and techniques such as distance learning, standardized patients, and psychometrics in order to enhance the quality and consistency of educational programs.**

V. REINFORCING COMMUNICATION SKILLS

FINDING 5. An increasingly diverse patient population and a changing health care environment magnify the need for effective communication by physicians.

Communication is a crucial factor in modern medical practice. In emerging health systems, three areas of enhanced importance have been identified i.e. clinician-patient, clinician-clinician, and clinician-community (Tresolini, Pew-Fetzer Task Force, 1994) and the complexity of each area developed (Inui, 1996).

Communication with patients involves much more than taking a medical history or conducting a clinical interview. It concerns communicating an understanding of lifestyle, health and illness with the patient and others and the integration of sociocultural factors into practice (Bolman, 1995). Effective communication not only enhances accuracy of diagnosis and treatment but also builds productive therapeutic relationships, encourages patient compliance and self-care, and enhances patient satisfaction with the physician (Kaplan, Siegel, Madill, Epstein, 1997/Marvel, Doherty, Weiner, 1998). In particular, residents must be skilled in many aspects of communication in order to effectively serve patients of diverse cultural and ethnic backgrounds. Effective clinical communication with such patients goes far beyond language comprehension (STFM Task Force, 1986/ Lurie, Yergan, 1990). Curricula have been developed to assist programs to ensure that all residents master the general principles of communication and cultural competency (Like, Steiner, Rubel, 1996). Mastery of general principles is stressed as the increasingly diverse U.S. population makes it unlikely that any one physician will develop true cultural competence for all of the patients he/she encounters (Zweifler, Gonzalez, 1998). The study of literature in medical education has also been advocated as a powerful means to enhance cultural competency and improve communication skills (Hunter, Charon, Coulehan, 1995).

Most understandings of physician-patient communication are based on physicians controlling medical knowledge and dominating therapeutic decisions. A recent development concerns communication with patients who are increasingly sophisticated "consumers" of health care and may have unparalleled access to medical information through electronic systems. The dangers of indiscriminate health information and recommendations, particularly on the World Wide Web are well recognized (Silberg, Llundberg, Musacchio, 1997) and recommendations have been made on using "information therapy" as a positive force in patient care (Bader, Braude, 1998). At a minimum, residents should know if their patients' usual sources of information and influence include electronic systems.

As medical practice is increasingly based on teamwork between individuals trained in different health professions as well as between physicians in different specialties, unambiguous and appropriate communication between colleagues is also assuming greater significance. In this area, too, electronic systems are beginning to be used in what was exclusively a verbal or written system with its own conventions (Bergus, Sinift, Randall, Rosenthall, 1998). Aspects of communication between colleagues include the understanding of team dynamics, and the facilitation of contributions by others as well as the articulate presentation of individual contributions (Inui, 1996). Certain systems of health care may place particular strains on specific relationships such as the consultation/referral relationship between generalist and subspecialist physicians, and the relationship between the physician providing direct patient care and one with responsibility for utilization review. The physician's role as a patient advocate adds a further dimension to communication skills. Effective interaction with the medical director of a managed care organization, a

hospital administrator, or with a community health care agency, requires skills that are rarely addressed in the educational process. Advocacy and conflict resolution become critical skills (Noble, Bethany, Macdonald et al, 1994) and, in parallel with them, medical ethics and resource allocation assume much more important roles.

Enhanced clinician-community interaction is valued by integrated health systems both to promote the concept of a member or patient community as defined by membership of the organization, and to affect major community health issues (Inui, 1996/Greenlick, 1992). The study of wellness and preventive medicine, population-based medicine, and community health advocated by many proponents of curriculum change imply an enhanced role in the future for physicians as educators of the communities and populations that they serve. If this responsibility is to be effectively carried out, additional skills will be required to communicate to large groups, including effective use of television, radio and other communication media. Physicians will also need to acquire the ability to interact effectively in a leadership role with health care administrators, politicians, and other community leaders.

Preparation of residents in communication must incorporate the use of multiple formats, technologies, and media. As already mentioned, communication in the era of the computer takes on new dimensions. The use of electronic communication has become a standard in many institutions among physicians in practice in the community. Some patients already use this method to communicate with their physicians, and physicians are using it to communicate with colleagues, health plans and hospitals. The legal and ethical implications of this revolution, particularly regarding confidentiality, remain problematic. Another feature of communication is access to professional information. Most hospital medical libraries and many physician offices now have access to the medical literature searching capabilities of the World Wide Web. The use of this technology is expanding exponentially as both physicians and their patients grow to understand the power of immediate availability of almost unlimited information. Many medical schools have introduced courses on medical informatics and other aspects of the technological revolution in communications. Equally important, but not always linked to such courses, is the growing curricular interest in Evidence Based Medicine (EBM). Most EBM courses stress the evaluation of medical information and provide practical assistance in distilling relevant and useful clinical information from the overwhelming volume of medical literature. Without a grounding in EBM, residents are poorly prepared to evaluate new and existing information or to understand and use clinical pathways, guidelines, or recommendations for patient care.

Another critical aspect of communication formats concerns clinical documentation. Experimentation with the electronic medical record is continuing in many locations. The prospect of a medical record that could be almost instantly available at any location is no longer a figment of the imagination. Within a few years, this technological advance will be in widespread use, and will raise issues such as confidentiality to new levels.

In all dimensions, verbal and written communication will continue to be essential skills for physicians. Comments from the health care industry, and from the human resources departments of companies purchasing health care plans for their employees indicate that poor physician/patient communication skills are one of the most troublesome and recurring problems that they face today (Gumbiner, 1994). The Medical School Objectives Project (AAMC/MSOP Report I, 1998) drew attention to multiple aspects of communication as essential competencies for graduating physicians and prepared a detailed monograph on medical informatics and aspects of community responsibilities (AAMC/MSOP Report II, 1998). In recent years there have been renewed efforts in the teaching, refinement and evaluation of communication skills (MSOP, 1998/Kaplan, 1997) and standardized patients are frequently used for both teaching and assessment of skills. Communication and related topics have been prominent in recent reforms of preclinical education (Curry, Makoul, 1998) but less has been published concerning their integration into subsequent training, or the retention/influence of such preclinical courses on residents' behaviors. Good progress has been made but much remains to be accomplished. The continuing complaints of consumers of health care are difficult to ignore and are likely to increase as changing population demographics bring physicians into contact with increasingly diverse patient populations.

Progress in the teaching of communication skills is an encouraging trend. However, such instruction frequently ends as medical students begin their first intensive clinical experiences and is revisited infrequently, if at all, during the remainder of medical school and residency training. Continuous reinforcement of communication skills, in every current and future modality, is needed throughout all four years of medical school, for the duration of residency training and into the setting of medical practice. The most advanced evidence

of commitment to communications skills as integral to the practice of quality medicine would involve the establishment of competency-based curricula with rigorous testing mechanisms to verify mastery of specified skills.

Recommendations:

- **Instruction in and assessment of communication skills, particularly related to the medical history, should be strengthened and expanded to ensure an emphasis equal to other major courses and topics.**
- **The development and augmentation of communication skills with patients, including those from differing cultural backgrounds, and with colleagues, administrators, and others should be continued throughout medical school and residency training.**
- **Physicians should be prepared in a broad range of communications skills appropriate for use with individuals and groups and utilizing a diversity of media. An emphasis should be provided on continually updating skills to adapt to rapidly-evolving circumstances and technology.**

VI. ASSURING QUALITY AND ACCOUNTABILITY IN PHYSICIAN EDUCATION

FINDING 6: The assurance of consistent quality in medical education will become increasingly critical as clinical teaching outside the traditional hospital setting expands and as teaching strategies become more diverse. Methods designed to assess performance evaluation at multiple sites and assure the longitudinal development of knowledge, skills, and attitudes are becoming increasingly important.

The necessity of achieving and sustaining the highest standards of physician education is the basis of this report and underlies each recommendation. The nature of medical education requires that quality must not only be achieved but that its immediate and long-term impacts must be documented and demonstrated to various constituencies, both internally and outside traditional medical education circles. Establishing education in non-traditional settings results in particular pressures to demonstrate both quality and credibility. As early as 1986, the AAMC concluded that continued societal support for medical education depends on systems which fulfill society's expectations in the production of skilled and qualified physicians and provide evidence that this is the case. Specifically, the report (AAMC 1986) notes:

- **The medical education community should continue to monitor the quality of its residency training and provide assurances that graduates of its residency programs are adequately prepared for practice.**
- **The institutions receiving funding should recognize their obligations to train the types of physicians needed by society.**
- **These institutions also must recognize their obligation to operate the training programs in a cost-effective manner.**

In recent years, the documentation of abilities, frequently in terms of demonstrable competencies in specific skills and mastery of cognitive knowledge, has become pervasive in medical practice. Examples include requirements to regularly re-establish specialty status ("re-certification"), credentialing processes mandated by various organizations, and the extensive review systems imposed to grant staff privileges by hospitals and medical centers. Clearly physicians face increasing requirements to achieve and document specific attributes of their knowledge and clinical practices. Medical schools and residency programs must prepare learners for the expanding role of evaluation and accountability in the practice of medicine. Incorporating such systems in the clinical and educational programs of medical schools and residency programs has both intrinsic and educational value.

Medical educators have to demonstrate the quality of their outcomes to at least three constituencies i.e. the learners, the sponsoring institution, and society at large. Medical learners should be confident that what they are taught will provide them the knowledge, skills, and other resources to meet their current and future responsibilities and aspirations. Faculty and institutions require continuous evaluative data to monitor and improve all aspects of programs, including their value in terms of educational gain for resources invested. Members of society at large are entitled to evidence that the educational programs they are supporting will appropriately prepare physicians for the needs of the community. The various constituencies have differing informational needs. As educational programs become more diverse and community settings more extensively utilized, the process of evaluation becomes increasingly complex (Glassick, Huber, Maeroff, 1997).

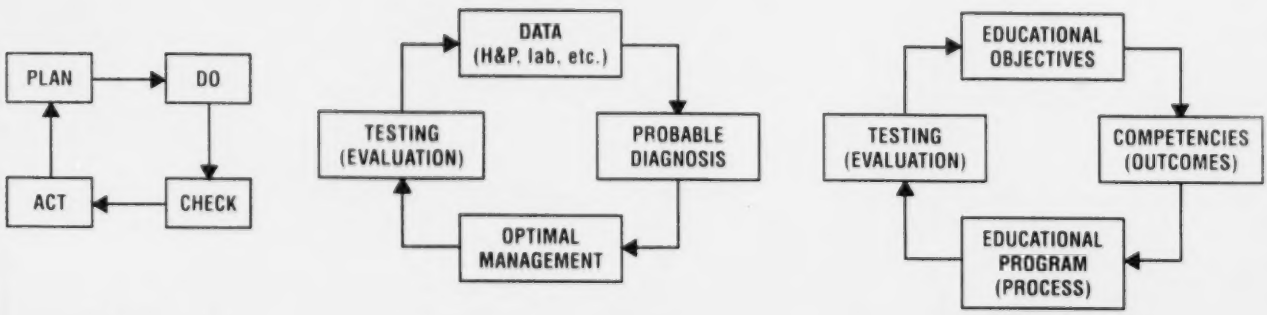
Conventional evaluation systems resemble the classical clinical method that proceeds in a logical

sequence to select the most probable diagnosis or effective course of action from data and continually re-evaluates findings in order to make the optimal decisions. In these apparently linear and logical systems, it is relatively easy to establish benchmarks for education and establish processes for evaluation of learning. The environment of modern medicine, however, is moving at a rapid pace, opening new and sometimes unpredicted variations of the classical model. To exploit the environment fully, future physicians must develop life-long learning skills and have a high tolerance for change and ambiguity (Hunter, Charon, Coulehan, 1995/ Bundner, 1962). Physicians must be prepared for much less predictable models of practice. Establishing benchmarks for quality in these new practice environments is challenging and controversial. In turn, strategies to evaluate educational programs must address the complexities that are encountered in a wide variety of practice models. Even if the technical issues of developing appropriate learning benchmarks and process of educational evaluation can be resolved, problems of objectivity remain. In the new educational models the traditional teacher-student relationship becomes more of an apprenticeship experience, thus potentially compromising objectivity in evaluation by both learner and instructor.

In newer systems of medical education, multimodal approaches are needed to demonstrate progress toward mastery of appropriate competencies. While some academic centers could modify existing strong assessment programs to meet new challenges in acquiring and reporting performance evidence, other centers need to develop entirely new systems. All teaching institutions require continuous evaluation systems capable of operating in complex, changing situations to ensure that learners are receiving the optimal educational experience and that this experience is of consistent quality across time and location. Several examples exist, particularly in predoctoral education, of institutions with robust educational objectives and/or specific competency statements that form the basis for the development of educational programs, allow for documentation of learning experiences, and provide guidance in the development of outcome indicators. Of particular importance to residency education is the selection of integrated evaluation systems based on educational goals that reflect the competencies required in the new practice environments and the on-going refinement of educational programs to ensure that education remains focused and relevant

One such integrated approach, the Shewhart Cycle, incorporates four critical components i.e. plan, do, check, and act (see figure 1) into an evaluation-improvement feedback system. The first component, developing the "plan", concerns the identification of the problem, appropriate audiences, optimal outcome indicators and initial strategy. The implementation phase ("do") refers to the performance of the selected strategy. "Check" involves the comparison of the achieved and expected outcomes with a strong emphasis on identifying areas for program improvement. The fourth step ("act") refers to incorporation of improvements to raise the standards of the entire process. Although often illustrated as a static cycle, the process is best conceptualized as a spiral with each stage driven by commitment to learning from experience in order to achieve a truly continuous system of improvement. The similarities

FIGURE 1
Similarities Between Three Integrated Evaluation Systems



SHEWHART CYCLE

CLASSICAL APPROACH TO PATIENT CARE

COMPETENCY-BASED EDUCATIONAL SYSTEM

between the Shewhart Cycle, the classical approach to patient care, and the competency-based educational system are illustrated in Figure 1.

From the learner's perspective, testing ("check" or "evaluation") provides verification that competencies are met, insights as to how educational objectives could be re-formulated to achieve higher levels of performance, and (in the case of a discrepancy between expected outcomes and those achieved) guidance as to remediation. For the educator, the approach enlightens each stage of the process:

- **do the specific objectives collectively achieve the program goals?**
- **what competencies/outcomes most effectively assess attainment of objectives?**
- **which programs/processes most effectively and efficiently achieve objectives?**
- **is the evaluation valid, repeatable, efficient?**
- **what does the evaluation reveal about potential improvement of the system?**

Evaluation methods are needed that benefit learners and educators directly (and other constituencies indirectly) by providing data-driven validation and guidance for improvement. For learners, validation reports can potentially be used both immediately and on graduation as evidence for credentialing. Learners can also use the system to identify areas of weakness, plan more effective study programs, and improve selection of coursework. For educators, the data validating program quality can be invaluable in both internal and external program review and accreditation. The increasingly precise documentation of potential for program improvement can also be used to articulate the need for resources and plan logical program development.

Clearly, no single approach to the assurance of educational quality can be used across all programs for all purposes. Successful models are characterized by well-defined intentional outcomes, structured unambiguous data collection processes, means for identifying discrepancies between current and intended status, and feedback loop systems. As the educational program moves into the community and the experience is re-defined to take advantage of the local environment, the complexities of measurement within the educational process become apparent. Collection of progress and process data should be unambiguous and equivalent at different sites. Data gathered in one site should be able to be interpreted in the same manner as data gathered from another site. It should be possible to combine data from several sites with confidence that such compilations will accurately portray system-wide perspectives. Systems should be designed to identify and assess discrepancies between current and intended status as a prerequisite to identifying barriers to success. Finally, intentional feedback loops should be in place to ensure the constant flow of information needed to continuously improve the system. In fulfilling all these criteria for effectiveness, the system must also be efficient. Overzealous collection of low-utility data results in systems that are too costly and complex to be useful and threatens credibility.

A variety of models for the specification of learning objectives exist (Katz, Fulop, 1978/ Patel, Evans, Groen, 1989/ Lipkin, 1989/ Price, Mitchell, 1993). Choice of the outcome indicator(s) is highly dependent on the context and the evaluator. For example, the educational objective "The learner will conduct an appropriate initial medical history" could be assessed by several different parameters, as noted in Table 1.

Those approaches that are ultimately the most effective are characterized by:

- **excellence in selection of objectives and outcome measures**
- **systems that enable continuous interplay between all components of the cycle**
- **unambiguous focus on quality improvement**

TABLE 1

Sample of Context & Evaluator Effect Upon Outcome Indicators

***Educational Objective:* "The learner will conduct an appropriate initial medical history."**

Context/evaluator	*Potential Outcome Indicators*
Faculty assessing a junior medical student	Are all components of an appropriate history included and recorded in a systematic fashion?
Patient responding to a satisfaction survey	Does the physician ask me all the questions I believe are important to understand my condition?
Faculty evaluating a resident	Can the subsequent diagnosis and treatment plan be supported by the medical history?
Billing Agent/payer	Based upon the billing sheet, are the appropriate components of the medical history appropriately recorded?

Voytovich, Rippey, and Mathews (1986) further elaborated the above criteria for effective educational evaluative/development systems as:

- **Clearly defined objectives delineate the content of the curriculum and provide the framework for specification of the learning experiences;**
- **Public statements of objectives permit both teachers and learners to understand and agree upon the intent of the curriculum;**
- **Evaluation methods can be directly linked to the objectives to be attained;**
- **Information from evaluation efforts are provided to both teachers and learners in a timely enough fashion and sufficient detail to allow for improvement in subsequent performance; and**
- **Unambiguous data are used as the basis for alterations of the curriculum should there be shown to be failures across various learners or sites.**

A variety of evaluation strategies are available to assess the educational process and its various components. The multiple models generally fall into two major groups (Scriven, 1967). The Formative mode is designed for on-going processes that have as their explicit intent to identify and effect change. The Summative mode is undertaken at the conclusion of a process and is used to determine if the specific objectives and/or standards have been achieved. The emphasis on feedback even in the validating summative models makes them opportunities for learning and growth of the curriculum. The selection of an individual strategy may be influenced by many factors including the environment, stage of evolution of the curriculum, degree of precision required, or availability of resources. Although increasing emphasis is being placed on objective and scientifically-measurable evaluation techniques, the nature of medicine will continue to require some role for subjective evaluations. Even in the traditionally "subjective" areas such as feedback from students, peers, patients, and others, insights from education and other disciplines are leading to greater quantification, reliability and reproducibility of data. Examples of educational components and possible assessment strategies are illustrated in Table 2 (Glaser, 1963).

TABLE 2

Examples of Educational Components and Possible Assessment Strategies

Educational Component	*Potential Assesments*
History taking, physical exam skills, interpersonal skills, verbal ability, technical facility	Direct observation with patients –by faculty –by trained observers
Problem formulation, diagnostic reasoning	Structured record audits
Diagnostic and therapeutic strategies	Indirect observation using prepared algorithms
Test ordering, prescribing patterns, cost effectiveness	Review of patient charts, pharmacy and laboratory reports
Information-seeking	Conferences, rounds, journal clubs
Basic medical knowledge	Traditional testing strategies
General judgment in care	Oral review of charts, reports from faculty and peers, patient management problems
Patient management	Standardized patients, review of patient charts
Technical abilities	Standardized patients, evaluation by teachers
Range of experience	Patient logs
Personal characteristics	Feedback from staff, patients, faculty; attitude measures

Evaluation is an essential and rapidly-developing component of medical education. Systematic scientific evaluation is fundamental to the changes advocated in order to prepare physicians for current and future practice environments. Much has been achieved, particularly in the adaptation to medical education of concepts and practices from business and education. Overall, however, the evolution of appropriate systems has been fragmentary and dependent on the dedication of individuals and a few institutions. To achieve the scope of change in medical education recommended by the Council, a greater, more pervasive, and more systematic national effort to achieve quality and accountability in all aspects of medical education is necessary.

Recommendations:

- **Medical educators should continuously assess both short-term and longitudinal outcomes in the learner, the teacher, and the program.**

- **Assessment techniques must be selected to provide reliable and valid measurement of educational outcomes across a variety of teaching environments.**
- **Academic health centers, educational programs, and accrediting agencies should continue to develop monitoring and assessment approaches that meet the needs of different constituencies.**

VII. FINANCING THE EVOLUTION OF GRADUATE MEDICAL EDUCATION

FINDING 7: The system of funding graduate medical education through teaching hospitals has inherent limitations and disincentives that inhibit the development of ambulatory experiences and community-based educational programs. There is still no consensus on how to appropriately fund and expand the curriculum to reach into community settings.

The financing of graduate medical education is complex and poorly understood. Studies have reported little consensus on the costs and other financial aspects of graduate medical education (Burg, Kelley, Zervanos, 1994). New models of graduate medical education, especially the substantial shifting of the locus of teaching to the community, further complicate this situation. Many authors have reported on the cost of education in the ambulatory setting, particularly for medial students. As discussed earlier in this report, studies emphasize the time commitment of medical school and community faculty, and loss or gain in clinical productivity at the training site (Jones, Korn, 1997/Goodwin, Gleason, Kontos, 1997/Rein, Randolph, Short et al, 1997/Franzini, Low, Proll, 1997) but assumptions drawn from the undergraduate experience may not be valid for residents. In particular, residents generate clinical income and may be valued by the community site as potential physician recruits (Adams, Eisenberg, 1997/Jones, Culpepper, Shea, 1995). An expert panel has recently proposed a general cost model for education in ambulatory settings as a basis for informed national debate (Boex, Blacklow, Boll et al, 1998).

While the funding of the educational mission is highly specific to each school or residency program, certain generalizations can be made. State-supported medical schools receive a variable proportion of their revenues from their respective legislatures, usually in the form of faculty salary support for the educational enterprise. Private medical schools are relatively more dependent on research grants and contracts, tuition, gifts, and endowments for the support of their medical student programs. Both public and private schools generate about one third of total revenues from practice plans (Jones, Ganem, Williams, Krakower, 1998).

GME is currently supported in substantial proportion by Medicare. Medicare funding is paid in the form of a direct capitation to teaching hospitals for each resident (Direct Medical Education support or DME), and through a percentage added to patient care payments to teaching hospitals (Indirect Medical Education support or IME). The implications of recent and proposed changes in the funding of GME on the numbers and types of residents and their educational process is unclear.

It is currently difficult to foresee any substantial new funding for medical education from traditional sources. The role of Federal government in GME is currently being reviewed. Medical school and residency program faculty are overextended in their current roles as they struggle to maintain teaching, research and clinical activities. Tuition accounts for only 3% of revenues for public schools and 5% for private institutions (Jones, Ganem, Williams, Yrakower, 1998), yet progressive increases in tuition fees at State-supported and private medical schools are becoming increasingly burdensome for students (Chhabra, 1996). Over 80% of the 1997 graduating class had educational debts—the highest percentage in eight years. The rate of increase of debt of medical students is increasing at alarming rates, particularly the growing proportion of graduating students carrying more than $100,000 in educational debts (Garrard, 1998). The mean debt for 1997 graduates of public medical schools was $69,000 compared to over $97,000 for graduates of private schools (Beran, Lawson, 1998).

COGME believes that neither faculty nor learners can be imposed upon for further increases in their financial contribution to medical education. As new systems of funding graduate medical education are developed, they must be based on effective partnerships involving the health insurance industry, organizations representing medical education, and State and Federal government agencies (Pew Commission Federal Policy Task Force, 1998/Fogelman, Goode, Behrens et al, 1996, AAMC and COGME consortia reports).

A major difficulty in designing new financial models for medical education is the lack of reliable, specific financial data on the current system. Without baseline data concerning costs and value, it is difficult to estimate the financial implications

of proposed changes in medical education or to draw conclusions about their value to institutions and, more important, to the public.

The nature of medical education makes the development of discrete educational budgets extremely difficult. Learning by immersion in clinical activities and quasi-apprenticeship with role models are core values, but they are also carried out together with other activities, as "joint products" which are the ones actually being supported financially. Many faculty members contribute to the teaching of residents and medical students with no direct remuneration from a teaching budget. Research faculty, who are often funded entirely from their research budgets, may also participate in teaching. Clinician faculty frequently teach both medical students and residents in the course of providing care to their own patients. Students and residents learn in environments where multiple other activities may be taking place simultaneously using a single set of personnel and resources. For example clinical, educational, and research projects could all be active in a clinic where patients were being monitored for the results of their treatment. The synergy between the three activities of teaching, research and patient care has been central to teaching institutions for almost a century. The current emphasis on cost-consciousness exposes the cross-subsidies and threatens the ability to succeed in any single mission. The costs of each activity must be disentangled (Pew Commission Federal Policy Taskforce, 1998).

The value, as distinct from the cost, of GME to the sponsoring academic medical center or other teaching hospital should also be assessed. The prestige of an affiliation with a teaching program may provide a marketing advantage with patients and healthcare plans. Other indirect benefits such as the ability to attract a higher quality medical staff and the creation of a more stimulating intellectual environment may also accrue. While it will not be an easy task, the development and testing of more sophisticated fiscal models may assist in arriving at progressively more accurate estimates of the cost of medical education.

Medicare teaching funds have always been provided on the basis that medical residents provide clinical service for which the sponsoring institution should be reimbursed. Therefore, funds labeled as education have in fact been paid for an inseparable nexus of service and education. Because of the long-standing ambiguity on this point, this long-established principle is currently under serious review by the Medicare Payment Advisory Commission, and the National Bipartisan Commission on the Future of Medicare. The Pew Commission (1998) has recently drawn attention to another "public good", that of uncompensated clinical care rendered by residents and faculty.

In the private sector, similar arguments are taking place. Many managed care organizations perceive no obligation to pay for medical education, particularly in the current highly competitive environment. These organizations will have still less incentive to contribute to medical education if a projected excess of physicians becomes reality and graduating physicians are perceived as poorly-prepared for managed care practice (Gold, 1996). Education is perceived as peripheral to the organization's mission and, in the corporate view, may be more appropriately supported through other sources.

In spite of the difficulties and complexities, discrete budgets for each activity are essential to monitor and manage the undertakings of teaching, patient care and research. Without good financial data it is impossible to advocate for resources appropriate to any one of the trilogy or make meaningful proposals to enhance the synergy between them. More meaningful systems of financial management are crucial to achieve the levels of accountability and logical evolution of medical education advocated in this report.

Alternative or supplementary mechanisms of funding resident education have been proposed. Among these are strategies to uncouple the funding of residency programs from teaching hospital budgets and channel it more directly to the training program. Under these circumstances, the education program, with less dependence on the hospital for support, would have more flexibility to develop a program that more closely serves the educational needs of the residents. Perhaps more importantly, mechanisms might be developed to link funding to the learning and demonstration of specific competencies. Thus, program funding would be linked not to hospital service but to the attainment of competencies in its graduates that prepare them for medical practice. (COGME Resource Paper, 1997/ COGME Sixth Report, 1995/ Pew,1998).

Preparation for the evolving medical practice environment requires that residents have experiences in non-traditional sites, which could include community health centers, health departments, physician offices, free-standing surgical centers, and integrated health systems. Educators should be free to place resident learners wherever the highest standards of medical care are practiced in their communities and the best learning environments exist or can be developed.

Establishing and sustaining quality teaching programs in community sites as advocated in this report requires resources. In the absence of new funding, medical schools and residency training programs will be faced with the necessity of redistributing their current budgets (Kassirer, 1996), and dispersing funds to clinician teachers in the community. While this may create tension for administrators and faculty alike, community clinicians and the organizations for which they work are becoming increasingly resistant to assuming a greater role in teaching without funding (Fogelman et al, 1996). Unquestionably paying clinical teachers in the community does create additional cost for teaching institutions, but it also imposes greater accountability on community faculty.

Regardless of the extent to which the principle of subsidizing medical education through clinical revenues will continue to be recognized, competency-based educational goals will not be achievable without significant levels of accountability throughout the system. COGME believes that teaching institutions should re-examine the financing of their education programs. They should attend to the urgent needs and recommendations set forth here without waiting for new sources of support to be found.

The GME system that finally emerges should recognize the vital national interest of educating the country's future physicians appropriately while distributing the costs to those, including patients and the health care industry, who benefit most. The system and its financing must be constructed to provide value. The asset to society, health care organizations, and individuals of well-prepared physicians must represent excellent value for the resources invested through taxes, payments and other forms of financing.

Recommendations:

- **A stable, reliable source of funding for graduate medical education is essential. While it is appropriate to assume that the Federal government through the Medicare program will continue to support graduate medical education, COGME endorses efforts to ensure that all payers including the Federal government support an equitable share of medical education costs.**
- **Medical schools, teaching hospitals and major stakeholders should prepare to finance physician education programs that incorporate the changes recommended in this report. Most of the funds to support these changes will require shifting existing internal resources within the academic enterprise.**
- **Funding for residency programs must provide the flexibility to meet the educational needs of residents. Program funding should be structured to enable graduates to attain the knowledge, skills, attitudes and values that will meet both the profession's goals and community needs.**
- **The value of graduate medical education to the sponsoring institution should be determined through a candid and explicit assessment of its financial, educational and service contribution to the achievement of the institution's mission.**

VIII. SUSTAINING QUALITY AND VITALITY IN MEDICAL EDUCATION

Finding 8: Creating and sustaining the educational changes required to respond to the changing medical environment will continue to be a challenge given the pressures of the medical marketplace and the complex missions of medical schools, academic medical centers and other teaching hospitals.

U.S. medical schools have experienced several changes in their culture during the last century. Since the Flexner report in 1910, a scientifically-based curriculum has been the core of medical education. This emphasis has contributed immeasurably to the establishment of modern medicine as a science-based profession. While there have been a number of significant evolutionary changes, revisions of the magnitude created by the Flexner report have not occurred. This report calls for comprehensive and profound change in full recognition that this challenge is made at a time of unprecedented difficulty for medical schools and residency programs. For many reasons, modification of existing educational programs and the introduction of new ones is becoming progressively more difficult. Resources are diminishing and there are mounting pressures on medical school and residency faculty to generate clinical income to support educational programs and research activities. The missions of research, clinical service and teaching are often in conflict, creating a tension between medical school and residency administrators and their faculty. Teaching institutions increasingly rely on clinical and contractual income to support multiple activities with consequent reduction of faculty

time available for teaching and the development of educational programs.

In spite of these pressures, medical schools and residency programs are institutions of enormous vitality, commanding impressive intellectual and other resources. Some schools and programs have been remarkably successful in introducing curriculum change. Their strategies may serve as models to other programs. A comprehensive approach to the introduction of new curriculum topics is hard to achieve and maintain particularly as in many "new" curricular areas such as human sexuality, alcoholism, and health care economics, the content does not fit well with traditional departmental responsibilities and courses may serve learners from several disciplines or health professions. As stated previously, some institutions may address the challenge to prepare physicians for the future by an incremental approach of continual modification to the existing curriculum. For others, perhaps the majority, major curricular reform will be the only feasible method of adequately preparing graduates for the realities of practice. Whatever approach is selected, the development of a substantial system of community sites to complement the role of the AHC and teaching hospital will be essential to provide the range of experiences required in modern medical education.

Many institutions have recognized the magnitude of the necessary change. In order to identify, implement, and sustain revisions in their educational programs medical schools and residency programs are reexamining their missions and culture, and committing the necessary funding and other resources to re-affirm their educational mission and tradition. Cultural change in any organization is difficult to accomplish and does not occur rapidly. Perpetuating comfortable and familiar strategies will simply widen the gap between the content of current educational programs, and the realities of medical practice for which graduates must be prepared.

This report emphasizes the development of teaching sites in the community that reflect the best of medical practice. The clinical teachers at community sites will be responsible for carrying out a significant portion of the clinical teaching mission of medical schools and residency training programs. As they come to understand that mission and participate in the growth and development of educational programs they will add an enriching perspective. Their contribution to the institution's programs and policies promises to be an influence that will maintain program relevance and strengthen links to the community. In spite of the many implications of closer relationships between "traditional" and community faculty, this strategy has enormous potential benefit to medical schools and residency programs.

As discussed previously, the development of an expanded teaching faculty in the community is likely to redefine the role of some "traditional" faculty members, requiring greater emphasis on planning, management, and evaluative functions. The clearer definition of the educational administrative role and its legitimization by the development of appropriate academic promotion systems is likely expand the cadre of faculty focused on medical education. The consequent expansion of research and development in medical education has the potential for enormous vitality and benefit to medical schools and residency programs.

The availability of funding from private foundations and Federal and State funding agencies has often been necessary to initiate curriculum change. The role of accrediting organizations at the State and national level has also been significant. Clearly, patients and health care organizations will continue to exert an influence on the quality standards of new graduates. Feedback from graduates may be the most effective stimulus to change as these individuals can articulate their experiences of discrepancies between their professional preparation and the expectations and realities of practice.

In the final analysis, the responsibility of medical schools to educate medical students is a unique and valued function. Other institutions conduct research and deliver medical care. Further, medical school is the foundation for graduate education, fellowship training and eventual practice. The changes recommended here must, therefore, begin in our medical schools. The vitality to implement and sustain a system of medical education which continually evolves to meet the changing needs of patients will come from the faculty, learners, graduates, community partners, and society at large. The implicit dedication of faculty members will be enhanced by greater clarity of professional roles, improved concordance between rewards (both financial and academic) and actual responsibilities, systems of continuous career development, greater sense of accomplishment in appropriately preparing physicians, and the potential of expanded areas for scholarship in educationally-based topics. Vitality in learners will be enhanced by appreciation of the appropriateness of their training and the expanded use of adult learning techniques. Finally, interaction with vigorous community partners in the new educational systems and the acknowledgment by society that its physicians are superbly prepared for practice, will enable medical educators to sustain excellence throughout times of continual change.

Recommendations:

- **Medical schools, residency training programs and teaching hospitals must balance their competing roles and reaffirm their educational mission. They should embrace the task of meeting societal need through the education of their graduates.**
- **The standards for accreditation and financial support of residency programs should be revised to encourage and facilitate new curriculum content and opportunities to acquire additional knowledge, skills, attitudes and values.**

References

AAMC. Financing Graduate Medical Education: Final Report of the AAMC Committee on Financing Graduate Medical Education, Association of American Medical Colleges, Washington, D.C. 1986.

AAMC. ACME-TRI (Assessing change in medical education: the road to implementation) report. 1992.

AAMC. Physicians for the Twenty-First Century: The GPEP Report. Report of the Panel on General Professional Education of the Physician and College Preparation for Medicine. 1984.

AAMC. Report I; Learning Objectives for Medical Student Education. January 1998.

AAMC. Report II; Contemporary Issues in Medicine: Medical Informatics and Population Health. June 1998.

Adams M, Eisenberg JM. What is the cost of ambulatory education? *J Gen Intern Med.* 1997 Apr;12 Suppl 2:S104-10. Review.

Adapting clinical medical education to the needs of today and tomorrow. New York: Josiah H. Macy, Jr. Foundation, 1988.

Allcorn S, Winship DH. Restructuring medical schools to better manage their three missions in the face of financial security. *Acad Med.* 1996 Aug;71(8):846-57.

Bader SA, Braude RM. "Patient informatics": creating new partnerships in medical decision making. *Acad Med.* 1998 Apr;73(4):408-11.

Beasley BW, Wright SM, Cofrancesco J Jr, Babbott SF, Thomas PA, Bass EB. Promotion criteria for clinician-educators in the United States and Canada. A survey of promotion committee chairpersons. *JAMA.* 1997 Sep 3;278(9):723-8.

Bell J, Frey D. Survey shows impact of students in preceptors' offices. *Fam Med.* 1998 Feb;30(2):82.

Beran RL, Lawson GE. Medical student financial assistance, 1996-1997. *JAMA.* 1998 Sep 2;280(9):819-20.

Bergus GR, Sinift, SD, Randall CS, Rosenthal, DM. Use of an e-mail curbside consultation service by family physicians. *J Fam Pract.* 1998 Nov;47(5):357-360.

Bethea L, Singh K, Probst JC. Clinical similarities and demographic differences between residency and private practice patients. *Fam Med.* 1996 Jul-Aug;28(7):472-7.

Blumenthal D, Cambell EG, Causino NA, Louis KS. Participation of life-science faculty in research relationships with industry. *N Engl J Med.* 1996 Dec 5;335(23):1734-9.

Blumenthal D, Meyer GS. Academic health centers in a changing environment. *Health Aff* (Millwood). 1996 Summer;15(2):200-15.

Blumenthal D. Ethics issues in academic-industry relationships in the life sciences: The continuing debate. *Acad Med.* 1996 Dec; 71(12): 1291-6.

Boex JR, Blacklow R, Boll A, et al. Understanding the costs of ambulatory care training. *Acad Med.* 1998 Sep;73(9):943-7.

Bolman WM. The place of behavioral science in medical education and practice. *Acad Med.* 1995 Oct;70(10):873-8.

Bordage G, Burack JH, Irby DM, Stritter FT. Education in ambulatory settings: developing valid measures of educational outcomes, and other research priorities. *Acad Med.* 1998 Jul;73(7):743-50.

Boyer EL. *Scholarship reconsidered: priorities of the professorate.* Princeton, New Jersey. Carnegie Foundation for the Advancement of Teaching; 1990. 147p.

Budner S. Intolerance of ambiguity as a personality variable. *J Pers.* 1962; 30:29-50.

Burg FD, Kelley MA, Zervanos NJ. Supporting primary care medical education. *J Gen Intern Med.* 1994 Apr;9(4 Suppl 1):S104-14. Review.

Burke W, Baron RB, Lemon M, Losh D, Novack A. Training generalist physicians: structural elements of the curriculum. *J Gen Intern Med.* 1994 Apr;9(4 Suppl 1):S23-30. Review.

Cameron JM. The indirect costs of graduate medical education. *N Engl J Med.* 1985 May 9;312(19):1233-8.

Cantor JC, Baker LC, Hughes RG. Preparedness for practice. Young physicians' views of their professional education. *JAMA.* 1993 Sep 1;270(9):1035-40.

Carlton B, Weston WD. Changing health professions education in West Virginia. *Acad Med.* 1997 Feb;72(2):110-5.

Chhabra A. Medical school tuition and the cost of medical education. *JAMA.* 1996 May 1;275(17):1372-3.

COGME Resource paper. Preparing learners for practice in a managed care environment. (Lurie) Sept 1997.

Cohen JJ. Educational mandates from managed care. *Acad Med.* 1995 May;70(5):381.

Cohen JJ. Leadership for medicine's promising future. *Acad Med.* 1998 Feb;73(2):132-7.

Cope DW, Sherman S, Robbins AS. Restructuring VA ambulatory care and medical education: the PACE model of primary care. *Acad Med.* 1996 Jul;71(7):761-71.

Crump WJ, Chambers DL, Bolt J. Initial community site development for first-and second-year medical students. *Fam Med.* 1996 Oct;28(9):634-9.

Crump WJ, Pfeil T. A telemedicine primer. An introduction to the technology and an overview of the literature. Arch *Fam Med.* 1995 Sep;4(9):796-803; discussion 804. Review.

Crump WJ, Tessen RJ, Montero AJ. The department without walls. Acceptability, cost, and utilization of interactive video technology. Arch *Fam Med.* 1997 May-Jun;6(3):273-8.

Curry RH, Makoul G. The evolution of courses in professional skills and perspectives for medical students. *Acad Med.* 1998 Jan;73(1):10-3. Review.

DeWitt TG, Goldberg RL, Roberts KB. Developing community faculty. Principles, practice, and evaluation. *Am J Dis Child.* 1993 Jan;147(1):49-53.

Epstein RM, Cole DR, Gawinski BA, Piotrowski-Lee S, Ruddy NB. How students learn from community-based preceptors. Arch *Fam Med.* 1998 Mar-Apr;7(2):149-54.

Ferenchick G, Simpson D, Blackman J, DaRosa D, Dunnington G. Strategies for efficient and effective teaching in the ambulatory care setting. *Acad Med.* 1997 Apr;72(4):277-80.

Fields SA, Toffler WL, Bledsoe NM. Impact of the presence of a third-year medical student on gross charges and patient volumes in 22 rural community practices. *Acad Med.* 1994 Oct;69(10 Suppl):S87-9.

Fields SA, Usatine R, Stearns JA, Toffler WL, Vinson DC. The use and compensation of community preceptors in U.S. medical schools. *Acad Med.* 1998 Jan;73(1):95-7.

Fincher RM, Case SM, Ripkey DR, Swanson DB. Comparison of ambulatory knowledge of third-year students who learned in ambulatory settings with that of students who learned in inpatient settings. *Acad Med.* 1997 Oct;72(10 Suppl 1):S130-2.

Finocchio LJ, Bailiff PJ, Grant RW, O'Neill EH. Professional competencies in the changing health care system: physicians' views on the importance and adequacy of formal training in medical school. *Acad Med.* 1995 Nov;70(11):1023-8.

Fogelman AM, Goode LD, Behrens BL, et al. Preserving medical schools' academic mission in a competitive marketplace. *Acad Med.* 1996 Nov;71(11):1168-99.

Fox PD, Wasserman J. Academic medical centers and managed care: uneasy partners. *Health Aff* (Millwood). 1993 Spring;12(1):85-93.

Franzini L, Low MD, Proll MA. Using a cost-construction model to assess the cost of educating undergraduate medical students at the University of Texas—Houston Medical School. *Acad Med.* 1997 Mar;72(3):228-37.

Friedman CP, Corn M, Krumrey AJ, Perry DR, Stevens RH. Managing information technology in academic medical centers: a "multicultural" experience. *Acad Med.* 1998 Sep;73(9):975-9.

Friedman CP, Purcell EF, eds. *The new biology and medical education: merging biological, information and cognitive sciences.* New York: Josiah H. Macy, Jr. Foundation, 1983.

Friedman CP. The virtual clinical campus. *Acad Med.* 1996 Jun;71(6):647-51.

Fulkerson PK, Wang-Cheng R. Community-based faculty: motivation and rewards. *Fam Med.* 1997 Feb;29(2):105-7.

Future Direction for Medical Education: A report of the council on medical education. Chicago, Illinois: American Medical Association, 1982.

Garg ML, Boero JF, Christiansen RG, Booher CG. Primary care teaching physicians' losses of productivity and revenue at three ambulatory-care centers. *Acad Med.* 1991 Jun;66(6):348-53.

Garrard, PS. The shared responsibility of medical students' deb. *Acad Med.* 1998 Apr;73(4):416-7.

Gjerde CL, Levy BT, Xakellis GC Jr. Unique learning contributions of a family medicine preceptorship. *Fam Med.* 1998 Jun;30(6):410-6.

Glaser R. Instructional technology and the measurement of learning outcomes. *American Psychologist.* 1963; 18:510-522.

Glassick CE, Huber MT, Maeroff, GI. *Scholarship assessed: Evaluation of the professoriate.* San Francisco, California: Jossey-Bass. 1997. 130p.

Gold MR. Effects of the growth of managed care on academic medical centers and graduate medical education. *Acad Med.* 1996 Aug;71(8):828-38.

Goodwin MC, Gleason WM, Kontos HA. A pilot study of the cost of educating undergraduate medical students at Virginia Commonwealth University. *Acad Med.* 1997 Mar;72(3):211-7.

Gray J, Fine B. General practitioner teaching in the community: a study of their teaching experience and interest in undergraduate teaching in the future. *Br J Gen Pract.* 1997 Oct;47(423):623-6.

Gray JD. Global rating scales in residency education. *Acad Med.* 1996 Jan;71(1 Suppl):S55-63. Review.

Greenlick MR. Educating physicians for population-based clinical practice. *JAMA.* 1992 Mar 25;267(12):1645-8.

Griner PF, Blumenthal D. Reforming the structure and management of academic medical centers: case studies of ten institutions. *Acad Med.* 1998 Jul;73(7):818-25.

Gumbiner R. Perspectives of an HMO leader. *Inquiry.* 1994 Fall;31(3):330-3.

Hafferty FW. Beyond curriculum reform: confronting medicine's hidden curriculum. *Acad Med.* 1998 Apr;73(4):403-7.

Hayashi SA, Hayden BB, Yager J, Guze PA. Graduate medical education in ambulatory care. *Acad Med.* 1989 Oct;64(10 Suppl):S16-21.

Heath JM, Beatty PG. Does teaching medical students in the office affect the way physicians complete patient-encounter forms? *Acad Med.* 1998 Apr;73(4):439-41.

Houpt JL, Goode LD, Anderson RJ, Aschenbrener CA, DeAngelis CD, Fortuner WJ 3rd, Korn D, Tartaglia AP, Weinstein BM. How medical school can maintain quality while adapting to resource constraints. *Acad Med.* 997 Mar;72(3):180-5.

Hunter KM, Charon R, Coulehan JL. The study of literature in medical education. *Acad Med.* 1995 Sep;70(9):787-94. Review.

Iglehart JK. The American health care system: managed care. *N Engl J Med.* 1992 Sep 3;327(10):742-7.

Inui TX. Reform in medical education: a health of the public perspective. *Acad Med.* 1996 Jan;71(1 Suppl):S119-21.

Irby DM. Teaching and learning in ambulatory care settings: a thematic review of the literature. *Acad Med.* 1995 Oct;70(10):898-931. Review.

Jacobs MO, Mott PD. Physician characteristics and training emphasis considered desirable by leaders of HMOs. *J Med Ed.* 1987 Sep;62(9):725-31.

Jones RF, Ganem JL, Williams DJ, Krakower JY. Review of US medical school finances, 1996-1997. *JAMA.* 1998 Sep 2;280(9):813-8.

Jones RF, Korn D. On the cost of educating a medical student. *Acad Med.* 1997 Mar;72(3):200-10.

Jones RF, Sanderson SC. Clinical revenues used to support the academic mission of medical schools, 1992-93. *Acad Med.* 1996 Mar; 71(3): 299-307.

Jones TF, Culpepper L, Shea C. Analysis of the cost of training residents in a community health center. *Acad Med.* 1995 Jun;70(6):523-31.

Kaplan CB, Siegel B, Madill JM, Epstein RM. Communication and the medical interview. Strategies for learning and teaching. *J Gen Intern Med.* 1997 Apr;12 Suppl 2:S49-55. Review.

Kassebaum DG, Eaglen RH, Cutler ER. AAMC Paper; The Objectives of Medical Education: Reflections in the Accreditation Looking Glass. *Acad Med.* 1997 Jul;72(7):648-56.

Kassirer JP. Redesigning graduate medial education-location and content. *N Engl J Med.* 1996 Aug 15;335(7):507-9.

Katz FM, Fulop T. *Personnel for Health Care.* Geneva: WHO, 1978.

Kearl GW, Mainous AG 3d. Physicians' productivity and teaching responsibilities. *Acad Med.* 1993 Feb;68(2):166-7.

Kirz HL, Larsen C. Costs and benefits of medical student training to a health maintenance organization. *JAMA.* 1986 Aug 8;256(6):734-9.

Krauss K, Smith J. Rejecting conventional wisdom: how academic medical centers can regain their leadership positions. *Acad Med.* 1997 Jul;72(7):571-5.

Lazarus GS, Foulke G, Bell RA, Siefkin AD, Keller K, Kravitz RL. The effects of a managed care educational program on faculty and trainee knowledge, attitudes, and behavioral intentions. *Acad Med.* 1998 Oct;73(10):1107-13.

Lemon M, Greer T, Siegel B. Implementation issues in generalist education. *J Gen Intern Med.* 1994 Apr;9(4 Suppl 1):S98-104. Review.

Lemon M, Yonke A, Roe B, Foley R. Communication as an essential part of program and institutional development. *Acad Med.* 1995 Oct;70(10):884-6.

Lesky LG, Borkan SC. Strategies to improve teaching in the ambulatory medicine setting. *Arch Intern Med.* 1990 Oct;150(10):2133-7.

Lewis YL, Bredfeldt RP, Strode SW, D'Arezzo KW. Changes in residents' attitudes and achievement after distance learning via two-way interactive video. *Fam Med.* 1998 Jul-Aug;30(7):497-500.

Like RC, Steiner RP, Rubel AJ. STFM Core Curriculum Guidelines. Recommended core curriculum guidelines on culturally sensitive and competent health care. *Fam Med.* 1996 Apr;28(4):291-7.

Lipkin M. Toward the education of doctors who care for the needs of the people: Innovative approaches in medical education. In HG Schmidt, M Lipkin Jr., MW de Vries, JM Greep (eds) *New Directions of medical education: Problem based learning and community-oriented medical education.* New York, Springer-Verlag, 1989.

Lurie N, Yergan J. Teaching residents to care for vulnerable populations in the outpatient setting. *J Gen Intern Med.* 1990;5(suppl):S26-34.

Magrane D, Gannon J, Miller CT. Obstetric patients who select and those who refuse medical students' participation in their care. *Acad Med.* 1994 Dec;69(12):1004-6.

Managed Care Digest Series: 1997. Kansas City (MO): Hoechst Marion Roussel; 1997. HMO market penetration; p. 18-9.

Managed health care. Implications for physician workforce and medical education. Council on Graduate Medical Education. September, 1995.

Marvel MK, Doherty WJ, Weiner E. Medical interviewing by exemplary family physicians. *J Fam Pract.* 1998 Nov;47(5):343-348.

McGee SR, Irby DM. Teaching in the outpatient clinic. Practical tips. *J Gen Intern Med.* 1997 Apr;12 Suppl 2:S34-40. Review.

McKee MD, Steiner-Grossman P, Burton W, Mulvihill M. Quality of student learning and preceptor productivity in urban community health centers. *Fam Med.* 1998 Feb;30(2):108-12.

McLeod PJ, Tamblyn R, Benaroya S, Snell L. Faculty ratings of resident humanism predict patient satisfaction ratings in ambulatory medical clinics. *J Gen Intern Med.* 1994 Jun;9(6):321-6.

Merenstein JH, Berg AO, Eidus R, Farley ES Jr, Fleming M, Garr DR, Scherger JE, Sclabassi S, Sherwood RA. Training residents for the future: final draft report. The STFM Task Force on Training Residents for the Future. *Fam Med.* 1986 Jan-Feb;18(1):29-37.

Meyer GS, Potter A, Gary N. A national survey to define a new core curriculum to prepare physicians for managed care practice. *Acad Med.* 1997 Aug;72(8):669-76.

Moore GT, Inue TS, Ludden JM, Schoenbaum SC. The "teaching HMO": a new academic partner. *Acad. Med.* 1994 Aug;69(8):595-600.

Nash DB, Markson LE, Howell S, Hildreth EA. Evaluating the competence of physicians in practice: from peer review to performance assessment. *Acad Med.* 1993 Feb;68(2 Suppl):S19-22.

Neher JO, Gordon KC, Meyer B, Stevens N. A five-step "microskills" model of clinical teaching. *J Am Board Fam Pract.* 1992 Jul-Aug;5(4):419-24.

Nelson HD, Matthews AM, Patrizio GR, Cooney TG. Managed care, attitudes, and career choices of internal medicine residents. *J Gen Intern Med.* 1998 Jan;13(1):39-42.

Noble J, Bithoney W, MacDonald P, Thane M, Dickinson J, Guyatt G, Bauchner H, Hardt E, Heffernan J, Eskew A. The core content of a generalist curriculum for general internal medicine, family practice, and pediatrics. *J Gen Intern Med.* 1994 Apr;9(4 Suppl 1):S31-42. Review.

O'Connor, PJ, Solberg, LI, Baird, M. The future of primary care: The enchanced primary care model. *J Fam Pract.* 1998 July:47(1):62-7.

O'Flynn N, Spencer J, Jones R. Consent and confidentiality in teaching in general practice: survey of patients' views on presence of students. *BMJ.* 1997 Nov 1;315(7116):1142.

O'Malley PG, Omori DM, Landry FJ, Jackson J, Kroenke K. A prospective study to assess the effect of ambulatory teaching on patient satisfaction. *Acad Med.* 1997 Nov;72(11):1015-7.

Pardes H. The future of medical schools and teaching hospitals in the era of managed care. *Acad Med.* 1997 Feb;72(2):97-102.

Parenti CM, Moldow CF. Training internal medicine residents in the community: the Minnesota experience. *Acad Med.* 1995 May;70(5):366-9.

Patel VL, Evans DA, Groen GJ. Reconciling basic science and clinical reasoning. Teaching and Learning in Medicine. 1989;1(3):116-121.

Perkoff GT. Teaching clinical medicine in the ambulatory care setting: An idea whose time may finally have come. *N Engl J Med.* 1986 Jan 2;314(1):27-31.

Pew Health Professions Commission. Health professions education and managed care: Challenges and necessary responses. Report on the Advisory Panel on Health Professions Education and Managed Care, 1995.

Politzer RM, Horab S, Fernandez E, Gamliel S, Kahn N, Mullan F. The impact of Title VII departmental and predoctoral support on the production of generalist physicians in private medical schools. Arch *Fam Med.* 1997 Nov-Dec;6(6):531-5.

PQE. Awarded Grants to 55 Residency Programs. Partnerships for Quality Education, 126 Brookline Ave., Boston, Massachusetts, January 1998.

Price DA, Mitchell CA. A model for clinical teaching and learning. *Medical Education.* 1993; 27(1):62-68.

Quirk ME, DeWitt T, Lasser D, Huppert M, Hunniwell E. Evaluation of primary care futures: a faculty development program for community health center preceptors. *Acad Med.* 1998 Jun;73(6):705-7.

Rein MF, Randolph WJ, Short JG, Coolidge KG, Coates ML, Carey RM. Defining the cost of educating undergraduate medical students at the University of Virginia. *Acad Med.* 1997 Mar;72(3):218-27.

Report of the Pew Commission Federal Taskforce. Beyond the balanced budget act of 1997: Strengthening Federal GME policy. 1998 Oct.

Reynolds PP, Giardino A, Onady GM, Siegler EL. Collaboration in the preparation of the generalist physician. *J Gen Intern Med.* 1994 Apr;9(4 Suppl 1):S55-63. Review.

Reznick RK, Blackmore D, Dauphinee WD, Rothman AI, Smee S. Large-scale high-stakes testing with an OSCE: report from the Medical Council of Canada. *Acad Med.* 1996 Jan;71(1 Suppl):S19-21.

Ricer RE, Filak AT, David AK. Determining the costs of a required third-year family medicine clerkship in an ambulatory setting. *Acad Med.* 1998 Jul;73(7):809-11.

Ricer RE, Van Horne A, Filak AT. Costs of preceptors' time spent teaching during a third-year family medicine outpatient rotation. *Acad Med.* 1997 Jun;72(6):547-51.

Rivo ML, Mays HL, Katzoff J, Kindig DA. Managed health care. Implications for the physician workforce and medical education. Council on Graduate Medical Education. *JAMA.* 1995 Sep 6;274(9):712-5.

Rosborough TK. Doctors in training: wasteful and inefficient? *BMJ.* 1998 Apr 11;316(7138):1107-8.

Schroeder SA. Expanding the site of clinical education: moving beyond the hospital walls. *J Gen Intern Med.* 1988 Mar-Apr;3(2 Suppl):S5-14.

Schuster BL, Haggerty RJ. Faculty—agents of change. *J Gen Intern Med.* 1994 Apr;9(4 Suppl 1):S50-5. Review.

Scriven M. *The methodology of evaluation. AERA Monograph Series on Curriculum Evaluation, No. 1.* Chicago: Rand McNally 1967.

Shugars D, O'Neil EH, Bader, JD. *Healthy America. Practitioners for 2005: An agenda for action for U.S. Health Professional Schools.* Durham, North Carolina: The Pew Health Professions Commission, October, 1991.

Silberg WM, Lundberg GD, Musacchio RA. Assessing, controlling, and assuring the quality of medical information on the Internet: Caveant lector et viewor—Let the reader and viewer beware. *JAMA.* 1997 Apr 16;277(15):1244-5.

Simons RJ, Imboden E, Martel JK. Patient attitudes toward medical student participation in a general internal medicine clinic. *J Gen Intern Med.* 1995 May;10(5):251-4.

Skeff KM, Bowen JL, Irby DM. Protecting time for teaching in the ambulatory care setting. *Acad Med.* 1997 Aug;72(8):694-7; discussion 693.

Skeff KM, Stratos GA, Mygdal W, DeWitt TA, Manfred L, Quirk M, Roberts K, Greenberg L, Bland CJ. Faculty development. A resource for clinical teachers. *J Gen Intern Med.* 1997 Apr;12 Suppl 2:S56-63. Review.

Spann SJ. Two-way interactive videoconferencing: why bother? *Fam Med.* 1998 Jul-Aug;30(7):513-4.

Steiner BD, Cook RL, Smith AC, Curtis P. Does training location influence the clinical skills of medical students? *Acad Med.* 1998 Apr;73(4):423-6.

Stevens DP, Leach DL, Warden GS, Cherniak NS. A strategy for coping with change: an affiliation between a medical school and a managed care health system. *Acad Med.* 1996 Feb;71(2):133-7.

Stevens DP. GME reform needs visionary academic leadership. *Acad Med.* 1997 Nov;72(11):986-7.

Swing SR, Vasilias J. Internal medicine residency education in ambulatory settings. *Acad Med.* 1997 Nov;72(11):988-96.

Tallia AF, Micek-Galinat L, Formica PE. Academic-community linkages: Community-based training for family physicians. *Fam Med.* 1996 Oct;28(9):618-23.

Tamblyn R, Benaroya S, Snell L, McLeod P, Schnarch B, Abrahamowicz M. The feasibility and value of using patient satisfaction ratings to evaluate internal medicine residents. *J Gen Intern Med.* 1994 Mar;9(3):146-52.

Tresolin CP and the Pew-Fetzer Task Force. *Health professions education and relationship-centered care.* San Francisco, California: Pew health Professions Commission, 1994.

Urbina C, Hickey M, McHarney-Brown C, Duban S, Kaufman A. Innovative generalist programs: academic health care centers respond to the shortage of generalist physicians. *J Gen Intern Med.* 1994 Apr;9(4 Suppl 1):S81-9. Review.

Vanselow N, Karalewski JE. The impact of competitive health care systems on professional education. *J Med Ed.* 1986 Sep;61(9 Pt 1):707-13.

Veloski J, Barzanski B, Nash DB, Bastacky S, Stevens DP. Medical student education in managed care settings: beyond HMO's. *JAMA.* 1996 Sep 4;276(9):667-71. Review.

Verby JE, Newell JP, Andresen SA, Swentko WM. Changing the medical school curriculum to improve patient access to primary care. *JAMA.* 1991 Jul 3;266(1):110-3.

Verby JE. The Minnesota Rural Physician Associate Program for medical students. *J Med Educ.* 1988 Jun;63(6):427-37.

Vinson DC, Paden C, Devera-Sales A. Impact of medical student teaching on family physicians' use of time. *J Fam Pract.* 1996 Mar;42(3): 243-9.

Voytovich AE, Rippey RM, Mathews DA. Deciding how to evaluate performance. In John S. Llody, Donald G. Langsley (eds) *How to Evaluate Residents.* Chicago: American Board of Medical Specialties 1986.

Wartman SA, Davis AK, Wilson ME, Kahn NB Jr, Kahn RH. Emerging lessons of the Interdisciplinary Generalist Curriculum (IGC) Project. *Acad Med.* 1998 Sep;73(9):935-42.

Wartman SA, O'Sullivan PS, Cyr MG. Ambulatory-based residency education: improving the congruence of teaching, learning, and patient care. *Ann Intern Med.* 1992 Jun 15;116(12 Pt 2): 1071-5.

Watson RT. "Managed education": an approach to funding medical education. *Acad Med.* 1997 Feb;72(2):92-3.

Wood, DL. Educating physicians for the 21st century. *Acad Med.* 1998 Dec;73(12):1280-1.

Wray JL, Sadowski SM. Defining teaching hospitals' GME strategy in response to new financial and market challenges. *Acad Med.* 1998 Apr;73(4):370-9.

Xakellis GC, Gjerde CL. Ambulatory medical education: teachers' activities, teaching cost, and residents' satisfaction. *Acad Med.* 1995 Aug;70(8):702-7.

Zucker S, White JA, Fabri PJ, Khonsari LS. Instructional intranets in graduate medical education. *Acad Med.* 1998 Oct;73(10):1072-5.

Zweifler J, Gonzalez AM. Teaching residents to care for culturally diverse populations. *Acad Med.* 1998 Oct;73(10):1056-61.

Zweifler J, Rodnick J. Medical education in a changing world: thoughts from California. *Fam Med.* 1998 Feb;30(2):127-33.

Selected Internet Resources

The volatility of the Internet precludes the development of "comprehensive" listings of resources sites. Faculties are urged to use the resources of the net to exploit its capabilities. Examples of the types of resources available at the time of this publication include the following (Note that no endorsement is implied and as with all net resources caveat emptor):

MEDICAL EDUCATION RING

http://www.med.jhu.edu/medcenter/mer

Educational resources per se and links to sites that contain information relative to medical education.

THE INTERACTIVE PATIENT

http://medicus.marshall.edu/medicus.htm

A web-based interactive patient encounter simulation.

MEDICAL INFORMATION FOR STUDENTS AND PROFESSIONALS

http://www.teleport.com/~megan/health.shtml

Links to information regarding basic and clinical science courses.

MEDUCATION

http://www.meducation.com

A comprehensive world wide listing of medical education links.

WEB DOCTOR

http://www.gretman.com/webdocotr/home.htm

A comprehensive index of Internet medical resources. A virtual library of peer-reviewed, professional medical information.

U.S. DISTANCE LEARNING ASSOCIATION

http://usdla.org

A membership organization of professionals interested in distance learning.

CENTER FOR EXCELLENCE IN DISTANCE LEARNING

http://www.lucent.com/cedl

Listings of technologies, alliances and resources.

THE EDUCATION COALITION

http://www.tecweb.org

In existence since 1933 promoting systematic educational reform through the use of multiple technologies.

PARTNERSHIPS FOR QUALITY EDUCATION

http://www.pqe.org

Listing of participating residency programs and their managed care partners

UNDERGRADUATE MEDICAL EDUCATION FOR THE 21ST CENTURY (UME-21)

http://www.aacom.org/UME-21/schools.htm

A demonstration of curriculum innovations to keep pace with the changing health care environment

U.S. Department of Health & Human Services

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